DECEMBER 25, 1922

THE RUBBER AGE

VOL. XII. NO. 6

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TABLE OF CONTENTS

Third Annual Dinner of Rubber Trade Ass'n a Rousing Success 201
Experiments with Rubber, Celluloid, and Hexalin 205
By Fordyce Jones
Some Prob'ems in the Manufacture of Rubber Heels 206
By Morris Omansky
Scientific Management for Rubber Manufacturers 210
By Alfred Baruch
South American Markets for Rubber Heels and Soles 213
News of the Rubber Chemists 214

NEWS OF THE INDUSTRY
R.G.A. Committee Coming Here in January 215
Annual Meeting of Firestone Stockholders 216
Personals and News Briefs 217-218

MARKETS
Cottons and Fabrics 219
Chemicals and Compounding Ingredients 220
Crude Rubber; Reclaimed Rubber; Scrap Rubber 221
American Rubber Patents; Trade Marks; New Incorporations 222

PUBLISHED ON THE 10th AND 25th OF EACH MONTH BY

THE GARDNER, MOFFAT COMPANY, Inc.

PUBLICATION OFFICE: HIGHLAND, N. Y.

ADDRESS ALL CORRESPONDENCE TO BUSINESS AND EDITORIAL ROOMS: 225 FOURTH AVENUE, NEW YORK

Telephone: Stuyvesant 4552

Advertising Forms Close Ten Days Before Date of Publication. Rates for Advertising Will Be Furnished on Application. Subscription Price: $2.00 per Annum. Single Copies 10 Cents. Canada, $2.50 per Annum. Foreign, $3.00 per Annum.

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THE
RUBBER AGE

VOL. XII. DECEMBER 25, 1922 No. 6

Third Annual Dinner of the Rubber Trade Association a Rousing Success

Yearly Report of President Henderson and Stirring Address by United States Senator Lenroot

THE evening of Thursday, December 14, 1922, will be long remembered by the 175 members and guests of the Rubber Trade Association of New York which assembled for its third annual dinner on that date in the Astor Gallery of the Waldorf-Astoria Hotel. Organized during the autumn of 1914, shortly after the outbreak of the World War, the association has held three events of this nature since that time—in 1919, 1921, and this year.

The keynote of the occasion—the spirit that promps these yearly gatherings—was sounded by Dr. Willard Scott of Brookline, Mass., humorist and after-dinner speaker of note, when he said:

"You business men are the real power in modern life today. You are the very heart and brains of economic opportunity of our day. And these annual gatherings of yours, where you may eat much and drink less (thanks to prohibition), are gatherings of the spirit as well as the flesh. You come together in good fellowship, forgetting for a moment the routine and competition of your daily trade, and your trade benefits by it as much as you do yourselves. It is the annual pilgrimage to Mecca by the business men of the country."

President Francis R. Henderson of the association acted as toastmaster. After some popular songs had been given by the entire assemblage, to the accompaniment of a six-piece orchestra, and the usual flashlight photograph of the diners had been taken, Mr. Henderson gave the signal to proceed with the "eats," which everybody was very willing to do.

Association's Fine Record in 1922

"One year ago," said President Henderson in making his annual report to the representatives of member firms of the association, "we had a lot of problems on our hands. Within the last two or three months we have seen the finish of all of these old matters that had been hanging fire. The directors have set their faces toward the future and toward the accomplishment of real constructive work in the New York rubber trade.

"During the past year more than 100,000 tons of crude rubber have passed through the hands of members of the association. Out of this large quantity only eight cases have been referred to the arbitration committee and only six have been referred for interpretation of contracts. This is certainly a record any trade association can be proud of. There were 176 cases in which the quality was in dispute. Of eight appeals only one decision was reversed.

"The Clearing Department has functioned in the smoothest possible manner. We had a hard struggle at first but all obstacles have been overcome. Today the arbitration situation has resolved itself into a simple and rapid procedure. Two firms applying for arbitration can have a complete settlement in a short time. Only ten days elapse between submission to the arbitration committee, decision, and settlement even in cases under appeal.

"The directors of the association realize there are many constructive things for us to do. Various branches of the trade in other countries look to New York for the solution of many trade problems. Before the depression in this industry set in there was more or less of chaos, but now all that has passed. We have always had a program, a constructive program, but business conditions were such that we could do little toward realizing some of our aims. Now, with everything cleared away, the directors feel that the association is in position to accomplish some very definite things.

Rubber Exchange Coming

"For example, we have seen considerable lately in the trade papers about the establishment of a rubber exchange in New York City. This idea, as you all know, is nothing new with us. In the fall of 1919 we appointed a Clearing House and Rubber Exchange Committee to investigate this matter and formulate plans for a rubber exchange. The committee reported in December of that year to the members of the association as a whole. In January 1920 the membership, with 75 per cent of the members as signatories, indorsed the clearing department and rubber exchange plan. The directors, however, decided to defer action so far as the establishment of an exchange was concerned, but the clearing department has been functioning since then.

"The necessity for a rubber exchange in New York has been in the minds of the association's directors for three years. Within the last few weeks the proposition has come up again. The directors deem it wise to wait until conditions are more propitious for it. We want to face the world with an exchange that will have 100 per cent membership and 100 per cent dignity, worthy of the great rubber industry that we represent. Until then we had better defer the matter."

Referring to the rubber restriction plan which the British had put into effect November 1, President Henderson said this was but a temporary measure of relief to the industry and that ultimately

The Menu

OYSTER COCKTAILS
OKRA SOUP, À LA CREOLE
CELERY OLIVES
LOBSTER, À LA THERMIDOR
MEDAILLON OF SPRING LAMB, COLBERT
Asparagus Tips, au Gratin
SQUAB CHICKEN ROASTED IN CASSEROLE, WALDORF
Hearts of Romaine, Astoria
NESSELRODE PUDDING ICE CREAM
MACAROONS LADY FINGERS
ASSORTED CAKES
COFFEE

the law of supply and demand must prevail.

"There was recently a reference in a trade paper to the 'protest' of American rubber manufacturers against the Stevenson plan. There has been no general protest by our manufacturers. In asking the Rubber Growers Association of London to send representatives over here, which I understand they are doing, American manufacturers merely wish to lay before them certain conditions of the industry here and to point out certain dangers to our British friends. We need international co-operation and co-ordination of effort in the rubber trade just as we do in statesmanship and government. It is my hope that all of the rubber associations of the world will get together and work for the benefit of each and all of us." (Great applause).

FRANCIS R. HENDERSON
President of the Rubber Trade Association of New York, Inc.

Senator Lenroot's Address

United States Senator Lenroot of Wisconsin was then introduced as one of the ablest and most eloquent men in the upper house of congress. The Senator said that despite the disparaging things said about senators and representatives in some newspapers, it nevertheless was a fact that the Senate and House have a sincere desire to serve the people of the United States. It was very important, he added, that the public men should come into contact with the business men of the country, give them the benefit of their knowledge and experience, and at the same time learn from business interests. Referring to the endless controversies of capital and labor, the senator declared that both parties must be given to understand that there is a third party which has something to say—the general public. Senator Lenroot's address, in part, was as follows:

"You are men of business, in a special field, but your business interest requires you to look out and beyond your special field and consider as business men economic and political questions directly affecting other fields than your own.

UNITED STATES SENATOR
IRVINE L. LENROOT
Principal Speaker at the Dinner

"We must all understand that the best service that America can render the world today is to make civilization secure in America. This cannot, will not, be done unless the private citizen realizes his responsibility as well as the public official, and both have a broad national vision instead of a narrow sectional or class viewpoint. The business man must learn that though he may be in the Rubber business in New York City, the textile business in New England, the steel business in Pennsylvania, he is vitally concerned with the welfare of the wheat grower of North Dakota, the dairy man of Wisconsin, the fruit grower of California and the cotton planter of the South. There can be no permanent material prosperity for many of us unless there be prosperity for all of us, and it behooves you to take an interest in questions affecting the prosperity of every class of producer for the prosperity of your particular business is directly affected.

"Now government is to blame for some things. It has some sins of commission, but more of omission. It has done some things it should not have done and left undone some things that should have been done—but there are also economic laws of trade, of supply and demand that no legislation can violate any more than we might prevent the tides of the Atlantic by passing a law that the tide should not rise today.

"I have said this much for the purpose of impressing upon you, if I can, the necessity for every business man to study the conditions before us, help us to improve what can be improved by Government and improve what can be improved by the application of sound business principles in the conduct of the business of the nation.

Prosperity Depends on the Farmer

"One fact we must squarely face, and that is there can be no permanent prosperity in this country until the condition of the American farmer is improved. There is no proper relation today between the price of the products of the farm and the price of the commodities which the farmer must buy, and for that reason the farmer has lost his purchasing power. He is practically out of the market, except for the barest necessities. He is not buying automobiles, trucks, farm machinery, lumber and other manufactured products. He will stay out of the market until his purchasing power is regained. It can be regained only by either an increase in the price of his products or a decrease in the price of the general commodities of the country. There does not seem to be any possibility of a decrease in the price of manufactured products, for wages are increasing and are now very near the peak of our war time prosperity. Nevertheless, it behooves every business man to practice every

WILLIAM H. STILES
Chairman of the Clearing Committee, Rubber Trade Association of New York

The Yearly "Pilgrimage to Mecca" of New York Rubber Men

Photograph by Drucker & Balles Co., New York

THE THIRD ANNUAL BANQUET OF THE RUBBER TRADE ASSOCIATION OF NEW YORK, INC., AT THE WALDORF-ASTORIA HOTEL, NEW YORK CITY, DECEMBER 14, 1922

economy possible and to be content with small profits until the balance is restored. Beyond that point, the balance must come through increased prices of farm products which, perhaps, can only come through curtailed production by the farmer. But there is great danger that preceding this restoration of balance, the farmer, the laboring man and others discontented, led by unprincipled demagogues will bring about such legislation as will be destructive not only of business that is weathering the storm, but of the farmers and laboring men themselves.

ROBERT L. CHIPMAN
Treasurer of the Rubber Trade Association of New York

C. T. Wilson was chairman of the Dinner Committee, with R. L. Baird his assistant. J. P. Sullivan is general manager of the association. William H. Stiles, former vice president, is chairman of the Cleaning Committee. The directors of the association, with their terms of office, are as follows:

1920-1923: J. T. Johnstone, H. A. Astlett, K. Wolff. 1921-1924: W. T. Baird, R. L. Chipman, O. Meyer, F. Pusinelli. 1922-1925: W. E. Bruyn, F. R. Henderson, W. H. Stiles, C. T. Wilson.

U. S. Rubber Goods Exports Increasing

EXPORTS of rubber manufactures registered a distinct recovery in October, the total value, $2,956,638, being close to $300,000 in excess of the preceding month, according to compilations by the Rubber Division of the Department of Commerce. The principal commodities in which exports showed increases were automobile casings and tubes, rubber belting, canvas shoes with rubber soles, and druggists' rubber sundries.

Exports of automobile casings from the United States increased in number from 107,457 to 113,000. The exports to Italy, Belgium, Sweden, Argentina, Uruguay, and Brazil were larger than for any preceding month of the year. Seasonal activity in the Southern Hemisphere is further indicated by large shipment to Australia and British South Africa. Australia, Brazil, Italy, and Sweden took a greater volume of our inner tube exports than for any other month in 1922, but the total number of tubes exported, 73,810, was about average.

Relatively large shipments of rubber belting to Argentina, Cuba, Panama, Brazil, Peru, Spain, Japan, Australia, New Zealand, and Portuguese East Africa accounted for most of the increase of $37,000 over the preceding month. Cuba, Argentina, Australia, and New Zealand also took larger quantities of rubber hose than usual.

Exports of rubber soled canvas shoes during October amounted to 225,941 pairs valued at $170,501. Our chief markets for rubber-soled canvas shoes were, Argentina, Cuba, the British and Dutch West Indies, Uruguay, British India, Australia, and New Zealand.

England is the principal market for druggists' rubber sundries and the increase from 11,107 pounds valued at $15,376 in September to 50,095 pounds valued at $50,011 in October accounts for the large volume of the October trade, which was only exceeded during March of this year.

The Speakers and Guests

GUESTS' TABLE

Francis R. Henderson, president of Rubber Trade Association of New York, toastmaster; Charles T. Wilson, vice president; R. L. Chipman, treasurer; H. A. Astlett, secretary; United States Senator Lenroot; William E. Bruyn and William T. Baird, former presidents of the association; H. T. Dunn, president of the Rubber Association of America, and A. L. Viles, general manager; W. M. Morse, managing editor of the *India-Rubber World;* D. Eastman, managing editor of THE RUBBER AGE; and Dr. Willard Scott, humorist and after-dinner speaker.

TABLE NO. 2

R. W. Earle, W. P. Earle, Sr., W. P. Earle, Jr., H. W. Laird, E. W. Laird, A. C. Forney, J. S. Allen, Norman Schaff, J. Ross Collins, Chas. E. Pettinos, J. J. Jones.

TABLE NO. 3

R. M. Littlejohn, Joseph Louis, C. S. Clark, J. VanBemmel, Joseph Maack, Ripley Ropes, J. W. DePiro.

TABLE NO. 4.

W. H. Dickerson, M. Manchester, F. Pusinelli, Lewin Thomas, Wm. T. Easley, John C. Treadwell, C. W. Walters.

TABLE NO. 5

Wm. H. Stiles, L. D. Stiles, Gordon Milne, F. H. Peaty, R. Hamilton, C. A. Morse, P. V. L. Bouton, C. B. Kaufmann.

TABLE NO. 6

H. H. Henderson, B. W. Henderson, H. M. Henderson, E. T. Meyer, H. K. Robertson, H. T. Helm, J. W. Herron, G. E. Perry, J. S. Rodenbough.

TABLE NO. 8

M. S. Rosenthal, Fred L. Arnold, J. Long, J. Wm. Oliver, S. S. Scudder, F. A. Borgemeister, R. S. Hardy, C. J. Lockhorn.

TABLE NO. 9

Henry Perlish, Lloyd M. Trafford, Joseph J. Lavine, Joseph A. Davey, Herman Muehlstein, Julius Meuhlstein, W. J. McCauley, C. W. Muller, Louis V. Keeler, W. R. Winans.

TABLE NO. 10

H. S. DeLanie, Louis W. Dumont, P. A. Murphy, I. Ochshorn, Wm. Walz, Robert Gale, Frank S. Jonas, J. Bremner.

TABLE NO. 11

J. T. Johnstone, D. D. Haldane, Walter H. Bass, E. F. Croeniger.

TABLE NO. 12

Fred B. Peterson, Ralph B. Woodbury, H. F. Godwin, C. G. Hill, R. L. Baird.

TABLE NO. 14

C. W. Baird, R. B. Baird, W. T. Baird, Jr., Jesse Dice, K. Wolff, John R. Wood, F. Lester Kittle, Leroy Wood.

TABLE NO. 15

E. Janesen, H. F. Tiedeman, H. R. Sanford, L. L. Eis, H. Loshe, J. Bush, M. Tingley.

TABLE NO. 16

N. Diamond, M. Erenstost, R. H. Toeplitz, H. F. Utley, A. Brady, S. Naganuma, K. Okuno, E. P. Wilcox.

TABLE NO. 17

H. W. French, John L. Handy, R. S. Baldwin, Hutchison Page, P. L. Byrne, George Biscaye, Harry R. Jefferds, E. G. Curry.

TABLE NO. 18

Fred Stern, Paul Elbogen, E. A. Pam, L. O. Heyworth, A. C. Spencer-Hess, C. F. McPhillips.

TABLE NO. 19

R. R. Kershaw, Harry Lyon, H. A. Daggett, David Moffat, T. K. Evans, Paul Bertuch, A. Guttman.

TABLE NO. 20

David S. Kubie, D. A. Mock, T. J. Ryan, M. Rothschild, H. Hauff, Elliott H. Simpson, Irving J. Louis, A. Bjerrehus, W. A. Pollen, A. F. Baarslag.

TABLE NO. 22

Robert Badenhop, Murray Millenthal, Leopold Spitz, Victor W. Fink, S. Yamanaka, K. Miyazaki, Leo J. Barber, Thomas Cordukes, F. B. Hosier.

Experiments with Rubber, Celluloid, and Hexalin

Successful Results Obtained, but Rubber Must Be Vulcanized by the Peachey Process to Produce a Commercially Valuable Rubber-Celluloid

By Fordyce Jones

THE writer is indebted to T. O. Kent, managing director of Oppenheimer, Son and Co., Ltd., for samples of hexalin recently obtained from Germany. It will be remembered that this solvent was recently advertised as a combined solvent for rubber and celluloid, and in connection with the writer's work with rubber glass it was felt that the product might be improved by the result of experimental work in this direction.

Hexalin is described as one of the "cyclo-hexanol" (?) series. It is a heavy, oily, colorless liquid, non-inflammable in the ordinary sense, but burning with a heavy smoky flame with the aid of a wick. It has evidently a comparatively low boiling point, and possesses a rich aromatic smell, which is not wholly objectionable to those used to such solvents. A sample placed on a watch glass in a water oven dried slowly off without residue.

When the sample was handed to the writer, it was stated that hexalin was found not to dissolve either rubber or celluloid. Samples of masticated rubber and shredded celluloid were shaken in the solvent on different occasions over three days. On heating up to boiling point no change was found in the celluloid sample, in fact it does not appear to dissolve at all, but the rubber slowly swelled and only a small part of it went into solution. Some of it has been under the action of the solvent for several days, but does not appear to go completely into solution.

Hexalin Combines Rubber and Celluloid Solutions

A heavy viscous solution of celluloid in amyl-acetate and 12½ per cent solution of masticated rubber in crystallisable benzine were mixed and about one-fifth of the total of hexalin was added. The solutions were easily miscible and remained without separation, but a slight cloudiness suggests an emulsion. The mixture dried out both at ordinary temperature and in the water oven without any apparent separation, whereas when celluloid and rubber solutions were mixed separation generally occurred. From this it may be deduced that hexalin has a combining effect, which certainly prevents the mixed solution from separating even after standing for a longer period.

The combined solution in some mixes used as a varnish has a considerable affinity for some metals and under certain conditions is only separated with difficulty from glass. The dried product can, however, be easily separated by the previous use of a suitable lubricant on the mold.

When painted on wood, leather, vulcanized rubber, etc., it gave a fairly quick drying varnish with a high polish, but in the mixture used the varnish was not very elastic, and was unsuitable for use on flexible materials. It appears that this mixture would have some value as a protective varnish on metals and other surfaces in many cases, but this query and others arising out of these notes may well be left to our rubber chemists.

Several different mixings were made up showing different percentages of rubber and celluloid. Samples dried out gave a product of good clarity and in many cases a mixture of good tensile strength. It will be appreciated that the product was very slow in completely drying out. This is evidently due to the presence of hexalin, as the separate solutions used dried fairly rapidly.

Commercial Possibilities in Plastic State and Solution

The solution seems to offer possibilities for use either in a plastic state or for the production of dipped goods, which can be made from it in the ordinary way. With shaped articles, of course, and solutions with a high percentage of celluloid, there would be some difficulty in stripping. The product remains highly inflammable. Even a mixture of rubber with only 5 per cent of celluloid burns easily, but the solution has the advantage of drying off with a resultant high gloss even under the most unfavorable conditions. Doubtless rubber could be combined with non-inflammable celluloid, as, for instance, cellulose acetate giving a practically non-inflammable product.

"The Analysis of Rubber"

THE ANALYSIS OF RUBBER, by John B. Tuttle. American Chemical Society, Monograph Series. 148 pages. Published by The Chemical Catalog Company, New York.

THIS book is intended for use by chemists in consumers' factories and for those who, without any prior knowledge, may be called upon to make an analysis of rubber or of a product which contains rubber. It is also hoped that the chemists in manufacturing plants will find the book of value when they are called upon to examine competitors' products.

The first part of the book is taken up with a discussion of the purpose of and need for chemical analysis of rubber. It is pointed out that there are a great many materials that are added to the rubber batch to produce various effects and that these materials must possess suitable characterstics before they can be used for this purpose with good results. The ascertaining of whether these substances come up to the set standards is accordingly of considerable importance, and one of the fuctions of this book is to give the chemist the best methods in use for making these determinations.

The composition of crude rubber and the tests for it are described in some detail. Then the preparation of rubber compounds is taken up, attention being paid to the various sorts of rubber that are used in the compounding, the various oil substitutes, mineral rubber, oils and waxes, vulcanizing materials, organic accelerators, inorganic accelerators, and inorganic fillers and pigments. Each of the various substances that fall in the above classifications is described briefly and a method given for its determination in the rubber batch. The theory of vulcanization is given a few words and then the proper methods of sampling and making the extractions are described. The tetrabromide, nitrosite, and indirect methods of determining rubber receive attention, as well as the method of determining sulphur. Mineral analysis is described in detail and a few words are said about microsectioning and microphotography. A comprehensive bibliography and two appendices, one on the preparation of materials for rubber manufacture and the other on physical tests, complete the volume.

A Prehistoric Rubber Ball

ACCORDING to *Science Siftings*, the oldest bit of rubber known is thought to be a shrunken, distorted ball found in 1909 in an excavation near Sasco, Arizona. It was taken, with some stone implements, from a prehistoric earthen jar uncovered at a depth of about three feet. It has a hard, cracked surface, incrusted with a buff-colored, plaster-like material, and when cut shows a block center of apparently good crude rubber.

Some Problems in the Manufacture of Rubber Heels

An Intimate Study of Unfavorable Conditions in the Factory and Retail Store, and the Remedies Proposed

By Morris Omansky

Consulting Chemist and Rubber Technologist

THE American rubber heel—and thus far it is the only one worth talking about—is a molded product. To many this appears to be its chief requirement. As one cigar manufacturer put it, "A rubber heel is a rubber heel and that is all that there is to it. The talk about quality in rubber heels is bunk. Now it is different with cigars. You have an obviously cheap cigar like the X...., good ones like the Y...., and numerous grades in between."

A cigar maker may be excused for such an opinion. But what are we to do about those in the rubber business who entertain such notions? There are many of them.

A rubber heel in use receives more abuse than any other rubber product. The tread of an automobile tire will usually run 10,000 miles or more before it gives out. The best of popular heels, that are to be found on the market, however, will not last one-tenth of that distance under ordinary conditions of use. Does the statement seem exaggerated? Consider it in another way. A man who walks ten miles a day does more than the average amount of walking. Yet there is no well-known rubber heel on the market which will last the average man fifteen weeks. Even if it lasted this length of time it would in the above case have covered only 1050 miles. To be sure, there have been cases where medium grade heels lasted the wearer more than a year. But in every such case the wearer spent most of his time indoors on smooth floors, usually sitting at a desk; or most of the outdoor activities would be in an automobile or on a nicely turfed golf course where, apparently, even unvulcanized rubber yields fair service. The average rubber heel, however, must withstand an abrasive and pounding action which no other rubber article has to meet.

ONE STAGE IN THE MANUFACTURE OF RUBBER HEELS

As to Hardness

A soft heel no more denotes high quality than does a hard heel indicate the opposite. It is possible to get any such effect in any grade of heel. There are, nevertheless, certain practical limits. A heel which is too soft will not resist abrasion well, nor will it buff to a reasonably smooth finish in a cobbler's shop or a shoe factory. Furthermore, a heel with too much "give" to it tires some wearers in a manner similar to walking on a soft sandy beach. Finally, heels which are too soft permit the nail washers to play too freely, with the result that either the nails loosen and break off or else the washers cut through the stock and the otherwise good heel falls off.

At the opposite extreme is the heel which is too hard. Such heels generally overcome the above objections only to entail new ones. This type of heel will generally resist abrasion, but it does not resist the cutting action of grit, cinders, rocks, metal chips, etc. Again, the characteristic property which makes rubber heels so desirable are missing, namely, its shock absorbing properties. Many people express a preference for the old leather heels over the heel of this type.

Women's heels, because of their much smaller area, must bear a higher pressure per square inch than men's heels. Such heels must be made harder than usual in order to overcome the squashing effect which is not noticeable in the men's sizes. The highest grade soft stock in a woman's heel allows either too much washer play or else crumbles away in a surprisingly short time.

Fortunately, the hardness of heels can now be measured and expressed as a numerical quantity. There is no longer any need of guessing the hardness of heels by feeling or biting. There are several inexpensive instruments which give excellent results although on an arbitrary scale. A compromise between the hardest and softest of the more popular brands on the retail market is advisable.

Buffing or Finishing

It is only occasionally that a rubber heel fits the shoe to which it is attached. Generally, it must be trimmed down to match the contour of the particular shoe to which it is applied. The rapidity of performing this operation is a factor in many shoe factories, usually where the work is on a piece-rate system. Then again, the appearance of the trimmed edge is also a factor. These problems are made more difficult by the fact that there are some shoe factories which are blessed with a stubborn insistence on using leather working devices in place of apparatus which is more suited to the working of rubber. Because cheap hard heels yield the best results in this operation they have unconsciously become the standards by which other heels are judged.

Undercured heels will trim poorly; where overcuring increases the hardness it will help the trimming. But where the compound is of such a nature that the overcure results in a softening of the stock it will have the reverse effect. Again, the properly cured heel which has aged several months will finish off better than when fresh.

Unreasonable Complaints by Users

In addition to the usual number of proper complaints, common to all branches of the rubber industry, the rubber heel manufacturer must contend with a large number of unreasonable criticisms. Customers will demand the finishing properties of hard cheap heels together with the liveliness of soft high grade heels in the same product. They will demand a uniformity of color in the case of tan heels never attained with leather and practically impossible to maintain in commercial production. Then there will always be samples of competitors' products which are "just as good and one cent a pair cheaper." Surrender to this is responsible for products which are a disgrace to the industry. It has also resulted in heels in which the sole purpose of the small amount of crude or reclaimed rubber is to reduce the brittleness of a mixture of bituminous materials and inorganic powders.

Criticisms from the shoe industry are at least sincere even

if made from a mistaken point of view. This is not so with many of the complaints received from cobblers. While this class demands and receives a better grade of heel than most shoe factories, its complaints are too often unreliable. Here are all the complaints of the shoe factory and many others which have their origin in pure malice.

There is some justification for the suspicion with which a new product is greeted, particularly when in competition with well established brands. This is but to be expected. But the misleading and most damaging reports are apt to come as the results of an unscrupulous propaganda much of which is started by sales representatives of well established competitors.

Again, the ignorance of many cobblers does not prevent them from being sly. They have a natural aversion to paying their bills, and the most worked excuse is that the quality is so poor that patronage of many old customers has been permanently lost. "Evidence" to support such claims has been made by grinding down the face of rubber heels on a buffing wheel or getting some friend to kick a pair of newly applied heels against a curb stone. The remains are then submitted as the results of one or two weeks' wear. A cleverer method of accomplishing the same result is to accumulate a number of heels which have been worn out through satisfactory service and have been removed for replacement. Such heels look naturally worn and it is often difficult to prove that they have not given satisfactory service.

PUNCHING RUBBER HEELS OUT OF COMPOUNDED SHEETS

It is well to discount the complaints of all those who have not paid for merchandise. When a collection of well-worn heels are submitted as "evidence" it will be well to examine them rather closely. Frequently it will be found that they contain a number of competitors' heels which have been complimented. Again, the cobblers have not as yet learned to make the same complaints at the same time. Therefore, a flood of dishonest complaints can be detected by their contradictory character. Thus, while some will say that the heel trims well but wears poorly, others will claim that it wears too well so that considerable trade is lost because replacements are not frequent enough. All possible permutations and combinations of kicks will be received and generally give the clue to unfair competition and propaganda.

Legitimate Complaints

False complaints like the above carry too much weight only because there are far too many legitimate complaints of a similar character. Competition for price rather than for quality is responsible for a flood of trashy products which as I have said are a disgrace to the industry. This has encouraged the notion that anything that looks like a rubber heel will do. Consequently many consumers look upon all rubber heels as poor products and therefore buy the cheapest. Then when the cheap product yields poor service wearers point out that experience justifies their suspicions.

The cheap heel must be accorded the same treatment recently given the "gyp" tire. Then only will the conscientious rubber heel manufacturer receive returns according to his merits.

Too many rubber heel producers are the innocent victims of their own honesty. They believe that if they put enough money into the compound quality is bound to result. I usually illustrate the fallacy of this to my clients by telling them that I can spoil any batch of a good heel compound by adding ten per cent of smoked sheets to it. This mistaken notion that high costs by themselves necessarily produce quality has given the market many high priced heels which give no better service than some of the lower priced and less pretentious grades. Which again tends to confirm the erroneous notion that all heels are alike.

Serious effort must be made to sort the illegitimate kicks from the sincere ones and the latter given the closest attention. This will guard the factory executive in charge of quality against deve'oping that one-track mind born of self-satisfaction that is too frequent an obstacle against further progress.

As to the Compound

The formula of the rubber compound is not determined by the intended use of the finished article alone. It must also be adjusted to meet the local production conditions of the plant where it is to be employed. Hence the futility of buying or attempting to furnish compounds without a practical working knowledge of the individual factory. Satisfactory compounds cannot be obtained by clerical processes with pencil and paper; they must be developed in the factory. Laboratory mill batches are time and money savers, but they can never replace the final adjustments which must be made on a production basis. The final adjustments can be made only during large scale production. It is only at this stage that the effects of uncured scrap, aging of stock, repeated workings, etc., can be determined and compensated for.

The rubber heel must be highly compounded to meet the requirements of hardness and buffing. This explains why it is so easy to spoil a good compound by the mere addition of rubber. Those compounding ingredients which produce the desired hardness with the maximum tensile strength will yield the best results. In obtaining this it will be found that the elasticity and shock absorbing properties of the rubber must be partly sacrificed. The choice of hardening constituents and their proportions are of prime importance. Many times the money wasted by the use of excessive volumes of rubber could be more efficiently employed by the use of reinforcing pigments in place of mere fillers. On the other hand, many medium grade and even cheap heels throw away considerable sums for the most expensive pigments which are of little value in such cases because of the lack of sufficient amounts of rubber.

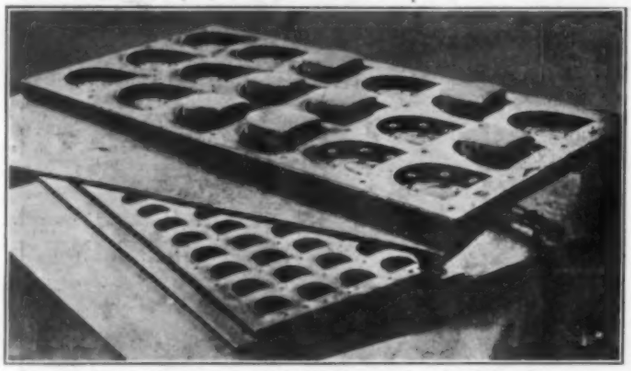
Unfortunately, the use of hardening ingredients reduces the plasticity of the stock and renders its subsequent manipulations more difficult and sometimes impossible. There are times when the heat developed on the mixing mill is sufficient to partly vulcanize or scorch the stock. At other times the

stock will not operate properly in the tubing machine where this is used. Indeed, if all these difficulties of preparing the stock are overcome, it will often be found that the uncured stock will not flow properly in the molds, resulting in poorly formed nail holes, poor edges, etc.

The compound must therefore be adjusted to meet these conditions in a manner that will not injure the quality of the finished product. These adjustments vary with different factories and sometimes with different pieces of equipment in the same factory. Such manipulations of the formula should only be permitted under the guidance of properly qualified technical men. Otherwise each adjustment, even if it solves the problem attacked, may give rise to a train of new difficulties.

Unscientific attempts to make such adjustments lead to the adoption of paradoxical formulas which are sometimes ridiculous. Some of these will contain large amounts of reinforcing pigments to toughen and harden the stock and at the same time excessive amounts of softening and weakening ingredients to aid in the subsequent manipulation. There are formulas employed every day which contain powerful accelerators to hasten the time of cure together with other ingredients the object of which is to retard the cure so as to prevent scorching on the mills. It is truly like the chauffeur who runs with his throttle wide open to get plenty of speed and power, and at the same time with his brakes set hard so as to be able to stop quickly.

Another danger is the rather common practice of substituting a pound of some new ingredient for each pound of the old one. Closely allied to this is the careless adoption of substances of proven value but which are new to the particular factory. Lack of proper knowledge and experience often results in serious losses. All ingredients of a rubber formula can be either used or misused. When the undesirable effects of the latter result, it is folly to attempt to avoid responsibility and try to shift the blame on to an inanimate substance.



Molds Used in the Making of Rubber Heels

Manipulation of Stock

Since it is not the object of this paper to describe the various processes of manufacture no attempt will be made to give such descriptions. Rather I shall assume a certain degree of familiarity on the part of the reader.

Where the tubing machine is used variations in the viscosity of the stock are a frequent source of annoyance and loss of production. This may be due to a similar variation in the crude or reclaimed rubber, but I am sorry to say that this is more often an overworked excuse and is not based on facts. It is generally more profitable to look for the source of this trouble in improperly broken down crude or reclaimed rubber, lack of uniformity in mixing, improper warming up of the stock prior to tubing, chilling of such stock, too stiff a compound, lack of proper cooling in the tubing machine, etc. The particular cause or combination of them cannot be discovered by the use of a slide rule nor by swearing at the world in general and the chemist in particular. The personal investigation of some qualified member of the technical staff is more certain to bring results than all the star chamber proceedings of the conference room.

The tubing machine converts the stock into a form which renders it suitable for use in some form of automatic cutting device or dinker to cut out the individual heel blanks. The calender, or its two-roll modification sometimes called a sheeter, delivers the stock more uniformly. Furthermore, it is not as sensitive to slight changes in the viscosity of the uncured stock. In fact it frequently disposes of stock which cannot be used in the tubing machine.

The best control over the overflow is therefore obtained by the use of the calender. This is desirable where the cost of the stock forms a large part of the cost of the finished heel and it is the only way successfully to control excessive overflow in such cases. On the other hand, it is often more profitable with cheaper stocks to endure a greater waste in the form of excessive overflow than to involve the greater costs of operating a calender.

Time and Temperature of Cure

Much so-called stock variation is really due to the variation in the conditions of vulcanization. Many presses are piped so as to render uniform cures only accidentally possible. The fittings of the presses are arranged in a manner which favors the accumulation of stationary pools of water which prevent the proper transference of heat to the mold.

Partly on account of this trouble many factories employ excessive curing periods of time together with excessive steam pressures. This misdirected effort to solve the difficulty may help but it by no means is to be considered a satisfactory solution. If the number of undercured heels are reduced the number of overcured heels are increased. There is a waste of coal which the chemist does not appreciate because it does not enter into his formula. The press capacity and therefore the efficiency of the department are seriously reduced. Furthermore, the unnecessary long time encourages pressmen on piece-work to cut the time of cure, thus defeating the very object of the long cure to prevent undercuring and blooming.

With intelligent control the time of cure should be determined by the ability of the operatives to change and fill the molds, allowing a reasonable but predetermined time for the placing of the nail washers. With eight nail hole cavities of a profitable sized mold the time of cure need not exceed sixteen minutes at sixty pounds of steam pressure in the press. Six high grade nail hole heels have been very successfully cured in twelve minutes at sixty pounds without the use of organic accelerators. The solution of curing troubles is as much a matter of steam engineering as it is a matter of compounding. Every professional compound man must be a good amateur steam engineer.

Sticking of Stock to Molds

A properly cured heel should not stick to the mold if the latter is reasonably clean. Undercured and overcured heels leave a tacky surface on the molds which, as it accumulates, aggravates the original trouble. Stocks which contain large amounts of non-rubber organic matter like tars, greases, resins, oils, etc., act in a double capacity of retarding the cure, but also soil the mold of their own accord. Successive heats soon result in the formation of tacky deposits on the mold.

The only proper remedy lies in the development of stocks which cure properly and do not soil the mold. This is not a Utopian dream. I have installed such compounds in every factory where I was given the proper authority. The use of solutions to coat the molds with a protecting surface is better than no remedy, but even these solutions produce dirty if less tacky accumulations which spoil the appearance of the heel and make necessary too frequent cleanings of the mold. With the exception of the very cheapest of stocks such solutions can be dispensed with.

When a freshly cleaned mold is put back into use it may be necessary to dust it with a little talc for the first few heats. Thereafter, even this should not be found necessary. After each heat all adhering overflow attached to the molds should be removed. The successive baking of this overflow is a cause of tacky formations on the mold. Where compounds are adjusted so as to require no anti-stick washes the molds are opened with a minimum of effort by the pressman and the heels are obtained with an almost mirror-like finish.

Blowing

So successful have most rubber factories been in bringing this trouble under control that I shall give it but brief consideration. Most blowing is caused by the presence of moisture in the stock. It is a pretty safe rule to follow that if you experience blowing one or more of your ingredients contains over one per cent of moisture. Undercured stocks, particularly of the cheaper grades of heels, may blow especially if they contain large amounts of substances like resins which form hydrogen sulphide when heated with sulphur. The remedy in either case is obvious to the technical man.

Blooming

With the exception of white goods, blooming heels are fast disappearing from the market and are generally considered unsalable. It is caused by the presence of excessive amounts of free sulphur in the finished heel. Just what the safe upper limit of this free sulphur is, to be safe from blooming, depends to a certain degree upon the nature of the compound. Generally, compounds with low acetone extracts cannot be considered safe from blooming out if they contain over 0.3 per cent of free sulphur. If the compound contains appreciable amounts of the so-called M.R. hydrocarbons or similarly acting substances, larger amounts of free sulphur are not in danger of blooming out. Thus I know of non-blooming compounds which contain as much as 0.7 per cent of free sulphur after cure.

The presence of this excess of free sulphur which causes blooming is the result of a number of effects. It may be caused by improperly heated molds or presses due to conditions already discussed. Overmilled stock does not cure as rapidly as that which has received less working on the mills and consequently come out insufficiently vulcanized with an excess of free sulphur. Poor steam is a frequent cause of this trouble. Sometimes the weighing room is generous and contributes more sulphur than called for by the formula. In such cases the heel should be distinctly overcured as well as blooming. Ordinarily, when a non-blooming compound blooms out some cause which prevents complete vulcanization is to be suspected. There are two other mechanical causes of undercuring and subsequent blooming which are not fully appreciated. In one very efficient and carefully conducted plant these were the chief causes of bloomed heels.

One of these is the intentional "cutting" of the time of cure on the part of pressmen in order to gain time or to increase their earnings on a piece-work system. Another is the accidental pulling of the wrong mold. These tendencies are combatted by a rigorous system of inspection and the installation of automatic recording devices.

There are also some chemical causes of blooming. Frequently, the presence of moisture will not be indicated by blowing but will show its effects by retarding the rate of cure with a resulting development of a sulphur bloom. Other substances, some accidentally and others intentionally introduced as part of the formula, also act as retarders of vulcanization and thereby produce blooming. This fact is of significance in changing the source or type of many of the organic compounding ingredients.

Thus far we have considered only sulphur blooms. There are many other ingredients which will bloom out. Paraffine wax, organic dyestuffs and accelerators, and other desirable organic constitutents will bloom out in themselves or cause other substances to bloom out if misused. We must remember that the use or misuse of any substance is determined by the properties of the substance in relation to those of the other substances with which it is used. Thus a paraffine content of 25 per cent may be perfectly proper in some types of cold cream, whereas 5 per cent in a rubber heel will produce an unsalable product that will appear as if it were dipped in molten wax. And so sulphur, the most desirable of compounding ingredients, produces unsalable bloomed or overcured goods when misused.

Appearance of the Heel

The appearance of many heels is spoiled by contamination with wood dust from the dinking machine blocks. Operatives should be warned that they are paid to cut rubber stock and not wood. A properly adjusted dinking machine will strike the die so that the stock is cut without sinking the die into the wood or fiber. When properly operated the die should leave but a slight imprint rather than a sharp outline of its cutting edge.

False economy in the purchase of cheaper open-grained woods is also a contributing cause. A tough dense wood like maple not only creates less dust but it lasts much longer and is therefore cheaper in the end. Some prefer the new fiber blocks. Furthermore, the frequent application of very light dressings of a suitable oil will also aid in reducing the dust formed and prolong the life of wooden blocks. Also, frequent light planing will be found to be more desirable than rarer heavy resurfacing.

The rather common practice of trimming off the overflow from the cured heels while they are still hot also helps mar their appearance. The heat causes an excessive flow of perspiration from the operative's hands, which soils the heel. Incidentally, operatives work more rapidly with heels that are near the normal room temperature.

The appearance of many heels which are packed in paper cartons is spoiled also by the lint from cheap paper stock. The manufacturers of these cartons are only too eager to furnish a better quality of cardboard which will overcome this difficulty at a slight increase in cost.

Tests of Quality

The time honored methods of determining the quality of rubber heels by biting, squeezing, and snapping are of little value except as a crude check on uniformity of production. I once had an assistant who was a marvel at making cheap heels snap. He would give me a favorable report on every heel compound he tried and prove his conviction with a loud and lively snap.

As with tires, the best test is the actual wearing test; but it must be intelligently carried out. Some people are very easy on heels and will give favorable reports on almost any kind of heel. Then, again, very few people really know how long a leather or particular rubber heel lasts. Nor is it advisable to depend upon the results obtained from trials made on the feet of executives or office workers. On the other hand, policemen and letter carriers are good subjects. Accurate records must be made and kept if the tests are to be of value. The human equation must be reduced to a minimum.

There are also other precautions to take. Most people are more severe on their right heel than on the other. Therefore it is necessary to run at least two tests when comparing competitive brands, making sure that the proper interchange on each foot has been made. Again, some people, like machinists, cut their heels on chips rather than wear them out.

Experience with wearing tests indicates that the wear-resisting properties of a heel are a function of the hardness, elasticity, and tensile strength. The tests with grinding wheels are in my opinion of little value because they exaggerate the abrasive action of wear and do not take account of the pounding and cutting action which are factors of great importance.

Relying, then, upon the results of the above mentioned tests, an experienced technician does not find it hard to place the quality of a given heel. Theoretically, many variations are possible. In practice this is simplified by the fact that to a certain extent some of these properties are supplementary. Thus, with reinforcing pigments increasing hardness accompanies increasing strength. Where the hardness is obtained by the use of large volumes of the coarser mineral fillers there is a marked dropping off in elasticity as well as in tensile strength.

The object of this paper has not been attained if it fails to stimulate thought. The problems connected with these simple appearing articles are more complex than those concerning goods which are more complex in structure. This branch of our industry has but recently come into its own. Processes and compounds are still governed to a great extent by those rule-of-thumb methods which have been abandoned in other branches of the industry. I have touched only some of the problems which are capable of solution by the application of scientific and common sense methods. But only after we have abandoned erroneous and obsolete conceptions of fundamental importance can we hope to gain a free hand to eliminate obsolete processes and useless ingredients.

SCIENTIFIC MANAGEMENT FOR RUBBER MANUFACTURERS

Labor and Material Costs - XII.

By Alfred Baruch

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THE description of the various methods of obtaining the cost of tires, tubes, and other products, that follows, will show how a system of scientific management such as has been described in the preceding articles will automatically yield accurate costs if the records are properly used and interpreted. The practice exists with many rubber manufacturers of taking the total expenditures over any busy period and dividing them by the number of units produced during the period to arrive at the cost per unit. This method might serve excellently in any factory that manufactures a single product and whose organization is so efficient that no improvement is possible, or rather whose production is so mechanical that no error is possible.

Unfortunately, this community seldom obtains. Most plants turn out more than one product, and because their present growth was attained either through necessity or opportunity they are not very efficiently organized. Consequently it is necessary for these factories to resort to some mechanism that will give them intelligent information as to the cost of each operation and each department. This is the reason for the existence of the cost system in modern industrial practice.

Advantages of the Cost System

Its advantages are obvious. It determines the cost of the product by units. This enables the manufacturer to compete intelligently with other producers of rubber goods. It points out the leaks due to faulty methods and indicates the corrections that can be made. After all, the true efficiency of the plant is best determined in dollars and cents, and the cost system does that. The cost system regulates buying policies by showing whether it is cheaper in each particular case to buy in large quantities and pay the consequent interest on the money invested, or in small quantities and depend on the sources of supply to prevent hold-ups in production. It affects the selling policies by showing the expense of the cuts that can be made in price without putting the selling price below the cost of production. It speeds up the turnover of money invested. It points out the lines produced which are unprofitable and should be dropped. It is really the manager's dividing line which tells him where improvements are needed.

However, the most elaborate cost system in the world will be of no avail if it is not established on the proper basis. By basis we mean the unit on which the cost is figured. All cost systems are based fundamentally on one of the two possible methods or a combination of both. These two are the time and piece methods. The systems which base the cost on time use either the productive hour or the money paid for the hour as the unit of measuse. The piece system uses the individual product such as a tire or a tube as the basis for calculation. In any rubber shop producing more than one article variations of both methods must be used.

It may be generally stated that in such cases the preparation departments must use the productive hour as the basis for cost and the manufacturing departments must use the piece. An analysis of the departments themselves will furnish the reason for this. The compound room usually mixes batches for all departments. Where this is done the batches will require varying lengths of time and consequently use up more labor, supervision, and equipment, which means more cost. Obviously the cost of each batch must be determined on the basis of the productive hour necessary to turn it out. The only occasion for using the piece or unit system of determining the cost would be where the compound room makes up only one type of batch or where the batches require the same length of time. Then all the expenses incurred in one day by the compound room should be divided by the number of batches normally produced in one day to determine the cost of compounding each batch.

The same would hold for the mill room. Where mills grind only one kind of stock for uniform lengths of time, the number of batches ground per day can be divided into the expenses incurred in one day to arrive at the cost per batch. These principles would also hold for the calenders, spreaders, and bias cutters. The cost of calendering could be determined on the unit basis if the calender were run at uniform speed all day long. Then the procedure would be something like this: Each calender would be isolated and turned into a department by itself. It would be charged with the cost of maintenance, with rent for the space it occupies, with labor, with supervision, and with its share of the general and administrative expenses. Then, the total cost chargeable to this machine over any given period such as a month or a year would be divided by 80 per cent of the working hours during that period. This reduces the cost of operating the machines to one hour, and from then on it is a simple matter to divide the normal production per hour into this cost in order to determine the cost per piece.

Establishing Production Centers

In the manufacturing departments this procedure can be applied to the whole department or to sections of it according to the nature of the production. Where this is uniform the total expenses chargeable to a department for any period can be divided by the units turned out during that period to determine the cost per unit. Where this is not possible due to the variation in time required for the different units production centers have to be established. By establishing production centers we mean grouping off the machines or work benches according to the nature of their product. Take the carcass building department, as an example. Our department will be divided into two sections,

CORRECT COST-KEEPING IN A RUBBER FACTORY

IN this article and the one to follow the author outlines what he considers the soundest principles and the most accurate and efficient methods of figuring and recording labor and material costs in a rubber factory. The Dewey decimal system of charging productive and non-productive work is given in some detail. Fifteen fundamental principles of cost-keeping are described under the following heads: Departmentalization, production centers, productive hour method, process cost method, standard hour costs, departmental burden, stock handling, general factory expense, administrative and selling expense, apportioned expenses, depreciation, delivery charges, interest on plant investment, defective work, normal rates.

one for cord and one for fabric tires. The cord tires will be made according to sizes, each group of sizes requiring different lengths of time for construction. The machines or tables on which these carcasses are built are separated according to the size groups and the expenses are apportioned to each group by one of the methods to be described later. The carcasses built by one of these groups in an hour are divided into the cost for the group per hour in order to determine the cost per piece.

The actual distribution of the various expenses and the method of arriving at them will be described in another chapter. As rubber production is usually on the stock basis it is not necessary to charge labor, material, and indirect expense to separate jobs, except in those departments where work is done on a jobbing basis, such as the mechanical rubber departments where combs and belts are made to special orders. Then, all expenses incurred in connection with these orders must be charged to them through the use of production order numbers. This also applies to cases where the rubber manufacturer makes up special brands of tires or tubes for big jobbers.

In the case of expenses several methods may be applied in collecting the expenses according to their time and according to the department or production center that incurs them. By this method every expense is really treated as an order and all labor and other charges accumulating against it are charged to it just as in the case of an order. The simple way to identify the expense orders is to assign a letter to them, as a, b, c, d, etc. The difficulty with this method is that within a short time so many letters are required that it is easier to write the details out. The second method is the use of mnemonic symbols. These represent some part of the name. Thus, the identification for gasoline for trucks would be Gt.., the mark for stock insurance would be Si, and the personal property taxes would be identified as Ppt. A less complicated and more effective system is known as the Dewey decimal system. By this method all productive and non-productive work is classified and the charges fixed for each class. For example, all salaries would be charged to 01. The salary of the factory manager is charged to 031. The salaries of the superintendents are charged to 032. The salaries of the foremen are charged to 033, etc.

This is an excellent method because it may be expanded indefinitely without becoming too cumbersome. The list of order numbers given below is by no means inflexible. It may be expanded or contracted to suit the size of the factory. But it should be borne in mind that the more detailed the classification of expense is, the easier it is to obtain accurate costs. It does not require more clerical labor to maintain a very extensive classification than it does to operate a small one. The number of entries will be the same but more sheets of paper will be required. The result will be an automatic analysis of the cost.

Administrative Expense Order Code

001—Executive salaries.
012—Clerical salaries.
013—Office supplies.
014—Association dues.
015—Printing and stationery.
016—Telephone and telegram.
017—Charities.
018—Miscellaneous expense.

Selling Expense Order Numbers

021—Salary of sales manager.
022—Salaries of salesmen.
023—Clerical salaries.
024—Traveling expenses.
025—Advertising.
026—Commissions.

Factory Expense Order Numbers

031—Salary of factory manager.
032—Salaries of superintendents.
033—Salaries of foremen.
034—Salaries of inspectors.
035—General labor.
036—Repairs to buildings.
037—Repairs to machines.
038—Repairs to tools and other equipments.
039—Maintenance of transmission.
040—Printing and stationery.
041—Maintenance of truck.
042—Gasoline.
Etc., Etc.

The above numbers simply indicate the use of this system of classification. A complete analysis of the items of expense chargeable to a production center will be described fully in another article. Meanwhile, it is necessary to consider the principles of cost that are used in a rubber plant. These principles are defined so that their application to rubber costs may be fully understood when the actual system is described. They are:

1. *Departmentalization.* This means a division of the plant operations into departments for purposes of cost keeping. That is, each of the major processes are treated as if they were individual plants and are held entirely responsible for the expenses they incur and the mistakes they make. This division is made necessary by the fact that the method of figuring the cost in one department may differ from that of another. In the system described below it is assumed that this factory does both a stock and jobbing business. By jobbing we mean that it actually works to sales orders whose specifications vary. This type of factory is selected for purposes of illustration and as the cost of each department is demonstrated separately, each man is free to select only those methods that apply to his plant.
2. *Production Centers.* The production center is a further division of the department. In order to be able to determine the cost of a product at each step in the process it is necessary to segregate the cost as the product passes through each machine or operation. In order to do this the machine is treated as a separate unit and charged with all the expense it incurs. For example, a calender is charged with floor space, rent, heat, light, power, maintenance, supplies, etc. As the product passes through it incurs a certain portion of these expenses according to the time it takes one pound or one yard to go through the calender. The actual cost for each operation is figured by the productive hour or the process cost method.
3. *The Productive Hour Method.* The productive hour method bases the cost on the quantity of work that this unit or production center can turn out in one hour. That is, an order for 1000 pounds of gum stock would be divided by the number of pounds that can be calendered in one hour in order to determine the number of hours that the order will occupy the calender and therefore the number of times that the cost of one hour must be multiplied in order to arrive at the cost of calendering this gum stock.
4. *Process Cost Method.* This method is a continuation of the productive hour method. Where the product is uniform and recurs at regular intervals, it simplifies matters a great deal to divide the cost for one productive hour by the number of units that pass through the production center in an hour in order to determine the cost per unit. Then when an order for 1000 pounds of gum stock comes to the calender all that is necessary to determine the cost is to multiply 1000 by the rate per pound. Of the two the latter is obviously the more simple method whenever it is possible to put it into operation but where a great deal of jobbing work is done the productive hour method must be used.
5. *Standard Hour Costs.* The standard hour cost is the predetermined rate for each department. This rate is arrived at by averaging the cost for each production center for a year or more. If one year's costs are available, the number of productive hours during that year are divided into the total so as to arrive at the cost of one hour.
6. *Departmental Burden.* This expense consists of all indirect labor, supplies, and other expenses chargeable to the individual department.
7. *Stock Handling.* All expenses incurred in the receiving, unloading, and storing crude rubber and fabric must be added to the first cost of the material.

8. *General Factory Expense.* This is the sum of all expenses immediately connected with production which cannot be charged directly to a department or an order and must therefore be apportioned to all centers on the basis of total productive hours.
9. *Administrative and Selling Expense.* This is the sum of all general administrative and commercial expenses. They are charged to each production order on the basis of a percentage of the total factory cost. That is, the sum of labor, material, and burden.
10. *Apportioned Expenses.* These are all other expenses which cannot be charged directly and must therefore be apportioned to the individual production centers by the method indicated below:
    a. Heat expense is distributed to each center on the basis of the number of square feet of floor space occupied.
    b. Light expense is distributed to each center on the basis of the wattage consumed on the normal day. This may be arrived at by meters or, as second choice, by the number of lamps and the capacity of each one.
    c. Power is distributed to each center on the basis of the horse power used times the number of hours these motors are in use.
    d. Compressed air is distributed on the basis of the number of cubic feet used.
    e. Insurance on stock is distributed according to value. Compensation insurance is distributed on the basis of the payroll.
11. *Depreciation.* This expense for wear and obsolescence is distributed to each center according to the money invested in it. The basis of value is the original cost plus all equipment and fixtures. As the rate of depreciation will vary with the condition of the machine at the time it was bought and with the use to which it was put, it is impossible to tabulate the depreciation rates for rubber machinery. However, several effective methods for calculating depreciation will be described later.
12. *Delivery Charges.* This item must be included in the general expense.
13. *Interest on Plant Investment.* The inclusion of interest on investment is recommended, especially where the interest acts as a substitute for rent or for labor saving devices such as building machines.
14. *Defective Work.* This item is charged to the individual production center, as indicated by the time reports. Where this information is hard to obtain, defective work may be charged to general expense although this practice is less desirable.
15. *Normal Rates.* The burden rates of each production center are predetermined. That is, the experience of as many years as possible is used in calculating what this expense should be in the future. For example, the average burden for one of the calender centers for the past three years may have been $2.00 per hour. This rate is adopted for the production center and is used regardless of actual conditions until the end of the year when the new rate is arrived at based on four years experience. The normal rate in the system outlined here is the indirect expense for a production center working at 80 per cent capacity. That is, the normal working hours for the calender center may be 400 for the month, and the indirect expense for the month may average $800. Instead of dividing the $800 by 400 hours, it is divided by 80 per cent of them or 320 hours. This gives a normal rate of $2.50 per hour. If the work slows up and the department operates only 240 hours, the orders are still charged with $2.50 per hour although the actual rate has risen to $3.34 per hour. Similarly, if the orders pile up and the machines work 400 hours during the month, the orders will be charged with $2.50 per hour although the actual rate has dropped to $2.00 per hour. This method of maintaining the normal rate regardless of actual conditions is the only way that has ever been found of insuring the proper return for burden expenses and still permit the plant to meet competition. Thus, the rate is actually higher than is necessary when business is good and prices are high, and lower than the actual expense when business is poor and the prices are down.

The above principles indicate the basis for a proper cost system in a rubber factory. The next chapter will show how the labor and material costs may be collected and properly distributed.

Crude Rubber Imports into U. S., Nov., 1922

Figures compiled and distributed by The Rubber Association of America, Inc., 250 West 57th Street, New York City.
(Estimated net weights—long tons)

PLANTATIONS

From	*Tons*
Batavia	872
Belawan-Deli	2,009
Cochin	22
Colombo	4,406
Hamburg	18
Liverpool	889
London	1,997
Malacca	782
Penang	1,864
Port Dickson	287
Pt. Swettenham	551
Rotterdam	606
Singapore	6,613
Sourabaya	776
Tandjong Priok	96
	21,788

AFRICANS

From	*Tons*
Antwerp	256
Liverpool	161
	417

CENTRALS AND GUAYULE

Centrals (Mexico and Central America)	4
Guayule(Mexico)	—
	4

PARAS

Bahia	5
Iquitos	6
Manoas	618
Montevideo	51
Para	369
	1,049

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons
Waste	32
Balata	100
Miscellaneous Gums	325

COMPARISON 1921-1922

	Nov.-1921	Nov.-1922	Total Importations 11 months ending, Nov. 30. 1921	1922
Plantations	18,631	21,788	150,379	241,099
Paras	916	1,049	10,318	9,207
Africans	190	417	1,836	2,094
Central	1	4	79	55
Guayule	—	—	58	281
Manicoba and Matto Grosso	—	—	3	122
	19,738	23,258	162,673	252,858

ARRIVALS PLANTATIONS FOR NOVEMBER, 1922 SHOWING PORTS OF ORIGIN AND ARRIVAL

From	*Arrived at*	*Tons*
Batavia	Los Angeles	16
Batavia	New York	856
Belawan-Deli	New York	2,009
Cochin	New York	22
Colombo	Boston	39
Colombo	New York	4,367
Hamburg	New York	18
Liverpool	New York	889
London	New York	1,997
Malacca	Baltimore	166
Malacca	New York	602
Malacca	Boston	14
Penang	New York	1,864
Port Dickson	New York	287
Port Swettenham	Boston	8
Port Swettenham	New York	543
Rotterdam	New York	606
Singapore	Boston	94
Singapore	Los Angeles	823
Singapore	New York	5,696
Sourabaya	New York	776
Tandjong Priok	New York	96
		21,788

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports		
New York	20,628	
Baltimore	166	
Boston	155	
		20,949
Pacific Ports		
Los Angeles	839	
		21,788

South American Markets for Rubber Heels and Soles

THE value of exports of rubber heels and soles from the United States to South America has increased from $72,581 during the whole of 1921 to $77,488 during the first eight months of 1922. This is especially remarkable because of the decreased exports to Brazil, which was our largest South American market for these products in 1920 and 1921. Rubber heels are manufactured quite extensively in Brazil, and while the product is inferior in quality to the American article, its low selling price makes it a competitive factor to be reckoned with in the present state of Brazilian exchange, and the percentage of the trade supplied by importation has decreased considerably as a result.

Good Markets in Argentine and Uruguay

Argentina is the next largest market to Brazil in South America for rubber soles and heels. Its purchases this year bid fair to eclipse even the 1920 figure of $32,710, and if the present rate of exportation continues, the total for 1922 will about double the value of the 1921 exports. The United Kingdom supplied most of Argentina's imports of heels until about 1917, but the United States has come to the front steadily since that time. The small round heels, formerly very popular there, have gradually been superseded by the full-sized American heels. The introduction of leather shoes with rubber heels by American firms has created a replacement market for the shaped heel and American exporters have naturally supplied the demand.

In Argentina rubber soles and heels are usually purchased by shoemaker's supply houses from the manufacturer direct, although some English and American manufacturers have resident agents there who call on the wholesalers regularly.

Conditions in the Uruguayan market for soles and heels are very similar to those in Argentina. Manufacturers do not attach rubber heels to shoes before they leave the factory. Heels are sold in retail shoe stores in Montevideo and no charge is made for attaching. United States exports to Uruguay are following the same general trend as those to Argentina.

Increased Exports to Colombia and Venezuela

A more important growth has occurred in the exports of rubber heels and soles to Colombia, the total value being already about 23 per cent in excess of the 1920 value, $18,221. Rubber soles and heels are quite commonly worn by the better classes in Colombia, practically all the imports coming from the United States even in pre-war years.

Consular reports from Venezuela indicate that rubber soles and heels are increasing in popularity there. Exports to that country have been steady, no decrease having occurred in 1921, and the belief that it offers a relatively good market is borne out by the trade this year which shows what may be termed a normal growth. Ecuador is likewise a relatively good customer, although of much less importance than Venezuela.

Peru and Chile Less Promising Markets

The Peruvian demand for rubber soles and heels has always been light. Rubber heels are not popular, foreign residents being the largest users. Some of the better grades of men's leather shoes are imported with rubber heels attached, and dealers are inclined to encourage this practice. An advertising campaign featuring the advantages would possibly create a greater interest in rubber soles and heels.

Considering its possibilities, Chile is perhaps the least encouraging of these markets from an American point of view. Its trade has revived less than some of the other South American countries, partly because of economic and financial conditions. Before the war Germany supplied this market, but during the war Great Britain replaced Germany, and the "Phillips" and "Wood Milne" heels became quite popular. Of the imports of "rubber soles and pieces for footwear" during 1920, amounting to 8,000 kilos, the United Kingdom supplied 50 per cent, the United States 40 per cent, and other countries 10 per cent. Decreased exports from the United States in 1921 and 1922 are perhaps due to increased competition from European exporters rather than the economic depression in Chile.

Several lots of rubber-soled shoes for summer use have been produced by one or two Santiago factories, but no stocks of rubber soles are carried by import houses.

Exports of rubber soles and heels to South America from the United States during 1920, 1921, and the first eight months of the current year are shown in the following table:

UNITED STATES EXPORTS OF RUBBER SOLES AND HEELS TO SOUTH AMERICA

Countries	1920	1921	January-August 1922.
Argentina	$32,710	$18,206	$25,811
Bolivia	9	1,542	724
Brazil	144,094	31,213	7,211
Chile	2,275	590	952
Colombia	18,221	8,551	23,693
Ecuador	831	591	2,097
British Guiana	2	.....	.....
Dutch Guiana	382	566	132
French Guiana	150	.....	4
Peru	678	1,381	1,193
Uruguay	17,190	3,660	8,731
Venezuela	5,351	6,281	6,940
Total	221,893	72,581	77,488

The development of our South American trade in rubber heels has been largely the result of shipments of leather shoes equipped with rubber heels from the United States to these markets. While the market will perhaps continue to develop at a normal rate without much attention, undoubtedly a quicker way of increasing our exports of rubber heels would be to induce South American shoe manufacturers to equip their output with rubber heels at the factory. The best markets in which to initiate such a campaign would appear to be Argentina, Brazil, Uruguay, Colombia, and Venezuela.

Shoe-Manufacturing Industry in South American Countries

According to the Shoe and Leather Manufacturers Division of the Bureau, the shoe industry is more advanced in Argentine, Brazil, and Chile than in other South American countries. Shoe manufacturing in Argentine is centered in Buenos Aires and it ranks second among manufacturing industries in that city in the number of persons employed. This industry is also extensively carried on in Cordoba, Rosario, La Plata, San Nicholas and Tucuman. In Brazil there are about 110 shoe factories having a capital of $3,068,400, with an annual production valued at $8,106,500. Modern shoe manufacturing is an important industry in Chile, there being approximately 50 factories in the country. Santiago is the center of the industry, more than one-half of the factories of the country being located there. The shoe factories in Brazil and Argentina are fairly well equipped with modern shoe-making machinery and the output includes Goodyear welts, McKay sewn and turn shoes. Chilean factories are also more or less equipped with shoe-making machinery.

Fireproofing Rubber Compositions

British Patent No. 183,922 is concerned with a process of fireproofing natural and artificial rubber or rubber-like substances and compounds. The rubber materials, particularly floor coverings containing rubber, together with inorganic or organic fibrous fillers are rendered less inflammable by the incorporation of casein and hydrated oxide of aluminum. To this there is generally added a small proportion of antimony trichloride. It is well to fireproof the fibrous materials themselves before they are covered with the rubber composition or added to the rubber batch.

NEWS OF THE RUBBER CHEMISTS

Solution of Ebonite

An interesting process has been patented in United States Patent No. 1,409,570 which is assigned to the E. H. Clapp Rubber Co. This process is for the solution of ebonite, a thing which it has been deemed impossible to do up to the present time. Liquid or semi-solid masses are obtained in this way.

The solvents are materials, which are recovered as by-products from the acid treatment of terpene-containing materials. Such substances as oil or spirits of turpentine are thoroughly mixed with commercial hydrated crystalline oxalic, about 2.5 to 10 per cent by weight, and the mixture is digested at atmospheric pressure or above at a temperature of approximately 140 to 163 degrees C. The mixture is allowed to cool until the oxalic acid is separated out. Then the product and the acid are separated and the product is washed to remove effectively all acid. The product is then subjected to fractional distillation to remove those oils having a boiling point less than 202 degrees C. A heavy oil residuum, which remains, is a solvent of ebonite and hard vulcanized rubber. Heavier distillates can be obtained on subjecting the residuum, mentioned above, to further distillation. These fractions also possess the ability to dissolve hard rubber.

The ebonite solution is obtained by stirring into the solvent finely ground ebonite. A sticky or pasty mass is obtained when equal proportions of ebonite and solvent are used. On exposure to heat the mass solidifies to a rigidity similar to that possessed by the original ebonite. The ebonite solution may be used to good advantage in coating various articles.

Duroprene, A New Rubber Product

"Duroprene" is the name given to a new rubber product, which is made by the complete chlorination of natural rubber. This substance has been investigated by German rubber chemists and has been found to possess certain advantageous properties which are not common to ordinary rubber. For example, the chlorinated rubber is considerably more resistant to the action of acids, alkalies, nitrous gases and other corrosive substances than the natural product. This makes the new substance usable in technical processes where such corrosive materials are handled. The investigation has shown, furthermore, that "duroprene" is very well suited for the production of insulating paper as well as for cementing and joining porcelain and stone-ware. It can be manufactured into rubber articles, in much the same manner as ordinary rubber. It has also been found that these articles are much more lasting than when made from natural rubber. Films, which are made from the new product, after they have dried, a process which requires several days, are impermeable to hydrogen gas, the lightest and most diffusible substance known. See *Gummi Zeitung*, 1922, page 1266.

Rubberized Fabrics and Rubber Goods

Rubberized fabrics are prepared by applying rubber latex with or without any other added ingredients, to the material that is to be treated. After drying and before vulcanization, the treated material may be subjected to a thorough washing process to remove the different albuminous matters that are natural to the latex. It will be noted that this is a process for the manufacture of rubberized cloth directly from the latex, and it forms one of the new uses for rubber latex that is a new use for rubber in the latex form in place of in the common crude rubber form, a modern development in the struggle to find new outlets for the over-production of rubber. For further details see British Patent No. 184,578.

Accelerating Effects of Different Accelerators

In the *India Rubber Journal*, 1922, volume 64, pages 75-77, there is given an account of a series of experiments, made to determine the comparative accelerating effect of dimethyldithiocarbamate, of dimethylamine, and of diethyldithiocarbamate of diethylamine. The vulcanization of mixtures of rubber (100 parts) and sulphur (8 parts) with and without the addition of zinc oxide (10 parts) at 286 degrees F (141 degrees C) showed that dimethylamine dithiocarbamate (0.25) and its diethylamine analogue are of considerable effectiveness in the absence of zinc oxide. An iodine derivative of the dimethylamine compound proved distinctly less active than either.

Accelerating the Vulcanization of Rubber

The vulcanization of rubber is accelerated by admixture of products which are obtained by the reaction of sulphur with para-nitroso-dimethylaniline or its homologues. The reaction between the aniline compound and sulphur results in the evolution of reddish fumes at a temperature of about 130 to 135 degrees C. These vapors or fumes can be condensed to give a reddish yellow substance, while a dark brown resinous product remains behind in the reaction vessel. Each of these two substances may be used as an accelerator of vulcanization. The improvement in the vulcanization process, which is gained by the use of these reactions products of sulphur and para-nitroso-dimethyl aniline, lies in the fact that when the latter compounds are used, the vulcanized products are free from spotty colorations, a condition which frequently results when the aniline compound itself is used to accelerate the vulcanization of the rubber. German Patent No. 351,974.

Vulcanizer

An installation, used for the vulcanization of rubber, usually consists of a certain number of vulcanizers and a steam generator, which feeds steam to all of them. Such an arrangement possesses certain disadvantages: the cost of installation and upkeep of the steam boiler, the necessity of maintaining the steam boiler in operation, even though only a few of the vulcanizers may be actually in use at the time. The arrangement, which is patented in French Patent No. 520,845, proposes the use of as many small steam generators as there are vulcanizing units. The steam generators are made of sheet metal and the water of condensation is recovered and reused.

Mercaptothioazoles as Accelerators

When added to a mixture of rubber and sulphur, which contains oxide of zinc, lead, magnesium, calcium, mercury, etc., one to three per cent of 5-methyl-2-mercaptothiazole greatly accelerates vulcanization, which is effected in five minutes at a temperature of 120 degrees C. The cadmium, lead, mercuric and especially the zinc salts of the thiazole exhibit similar accelerating action. G. Bruni and E. Romani. Atti. R. Accad. Lincei., 1922, volume 31, pages 86 to 88.

Heat Vulcanization of Rubber

Cylinders, presses, jacketed autoclaves, and dry heat chambers for vulcanizing are heated by means of one or more substances, other than a solution, which have a boiling point higher than water. In this way high temperatures can be obtained at low pressure. The substance or substances, for example, aniline oil are circulated between the source of heat and the vulcanizer. This process has been patented by the Victoria Rubber Co. in British Patent No. 181,802.

NEWS OF THE INDUSTRY

R.G.A. Committee Coming Here in January

P. J. BURGESS
Vice-Chairman of the R.G.A.

H. ERIC MILLER
of Harrisons and Crosfield Ltd., Member of Council of R.G.A. and of the Stevenson Committee

SIR STANLEY BOIS
Past Chairman of the R.G.A. Member of Stevenson Committee

The Rubber Association of America on Dec. 6 received the following cablegram from the secretary of the Rubber Growers Association of London:

"Referring to your telegram Nov. 29. Council of association have appointed following three members to meet your representatives: P. J. Burgess, vice chairman; Sir. Stanley Bois and H. Eric Miller. Anticipate visit will be made in January but will notify boat as soon as arranged."

The R.A.A. cable referred to was as follows:

"Referring to your letter of Nov. 13. In view of existing conditions and our conception of conditions that will prevail in 1923, our committee still believes it very desirable to meet representatives of your association here. Hope visit can be arranged as soon as convenient after the holidays. Writing."

R.A.A. Bulletin 185, dated Nov. 28 reads, in part:

"When dealing with these representatives of the growers, it will be positively essential that we have thoroughly comprehensive and accurate information concerning the actual past consumption of crude and reclaimed rubber and that which is expected during the coming year or so.

"Therefore, as a necessary factor in preparing for the contemplated negotiations, the Association's special committee will, within a few days, call upon every rubber manufacturer in the United States (members and non-members of the association) to respond to a brief questionnaire covering the *total* consumption (not divided by products) of crude and reclaimed rubber in 1919, 1920, 1921 and eleven months of 1922. The inventory record of manufacturers, importers, and dealers covering rubber on hand and afloat as of October 31 will probably be requested also, as this will enable our special committee to know the extent of crude rubber stocks at the time the restriction plan became effective."

Firestone Sales for Fiscal Year, $64,507,301

The sales of the Firestone Tire & Rubber Co., Akron, for the fiscal year ending Oct. 31 last were $64,507,301, an increase of 23 per cent over the previous twelve months, according to President Harvey S. Firestone's annual statement to stockholders on Dec. 15. The earnings were $7,348,421 after deducting depreciation, interest, taxes and other charges.

The company's assets totalled $60,718,634 including $5,715,459 in cash, $21,174,350 in real estate and plants, and $9,890,050 in inventories. Bank indebtedness was reduced from $21,680,000 at the beginning of the fiscal year to $12,775,000.

The Firestone Canadian Co. financed itself through the sale of $1,500,000 seven per cent bonds, and the parent company owns the entire outstanding preferred and common stock.

In his report Mr. Firestone advocated congressional legislation to encourage American capital to develop rubber plantations in the Philippines where, he said, the soil and climatic conditions are equal to any rubber producing belt in the world.

Annual Meeting of Firestone Stockholders

J. J. Shea New Treasurer -- J. G. Robertson in Charge of Investments -- Dividends Declared

In addition to declaring the regular quarterly dividend of 1½ per cent on the 6 per cent preferred stock, payable January 15, 1923, to holders of record January 1, and 1¾ per cent on the 7 per cent preferred stock, payable February 15 to holders of record February 1, the directors of the Firestone Tire & Rubber Company elected J. J. Shea treasurer to succeed J. G. Robertson, who had held the office twelve years.

All of the old directors were re-elected at the annual meeting of the stockholders, and the directors, meeting later, made the one change in the list of officers.

Mr. Shea was elevated to his new position from the office of general auditor, and is succeeded by H. H. Hollinger, who had been assistant general auditor.

Mr. Robertson, who had through his constant contact with the subsidiary interests become thoroughly conversant on the many ramifications, now holds the position of director in charge of all investments represented by these subsidiaries. He will devote his entire time to looking after investments, real estate, tax matters, insurance, etc., pertaining to these concerns.

The subsidiary interests extend to divergent localities both in America and foreign countries, including investments in Singapore, South America, England and Canada, besides the Firestone Steel Products Company in Akron, the Firestone-Apsley Rubber Company in Hudson, Mass., the Xylos Rubber Company in Akron and the Coventry Land & Improvement Company, also of Akron.

In addition to the properties mentioned, Mr. Robertson will have under his supervision tax matters, insurance and investments affecting the company's more than sixty branches situated in the various large cities of the country. Mr. Robertson is very well known in financial circles. He has just returned from a several months' trip to states west of the Mississippi, during which time he visited many of the company's western branches.

With the election of Mr. Shea to the treasurer's office, the official roster is as follows: H. S. Firestone, president; A. C. Miller, vice president; J. W. Thomas, vice president; Thomas Clements, vice president; S. G. Carkhuff, secretary; B. M. Robinson, assistant secretary; J. J. Shea, treasurer; R. S. Leonard, assistant treasurer; H. C. Campbell, assistant treasurer.

The directors are: H. S. Firestone, A. C. Miller, J. W. Thomas, C. A. Myers, S. G. Carkhuff, L. E. Sisler, J. G. Robertson, H. S. Firestone, Jr., and Thomas Clements.

Gates Paid $100,000 Bonuses

More than $100,000 in bonus dividends have been paid during the past year to employees of the Gates Rubber Co., Denver, Colo. On Nov. 1 a quarterly profit bonus of 15 per cent was paid and on Feb. 1 it is expected that the quarterly bonus will exceed this distribution. The dividend is based upon the company's net earnings.

$17,802 Awards at Goodyear

In more than ten years Goodyear has paid out $17,802 in 5,189 awards to employees for 54,881 suggestions from factory workers for increasing efficiency and improving working conditions. The average award is between $10 and $15. One janitor has received in that time more than $600 for suggestions accepted.

Triples Capital Stock

There was a special stockholders' meeting on Dec. 7, of the Easthampton Rubber Thread Co., Springfield, Mass., to vote on a proposed increase in the capital stock of the company from $400,000 to $1,200,000. The purpose of this increase was not stated.

Firestone Scholarship Awarded

Karl G. Pearson, seventeen, a student in Eastern High School, Washington, D. C., has been awarded the Firestone university scholarship. He is a native of Lindsborg, Kans. His essay, "How Good Roads Are Developing My Community," was selected as the winner from among 250,000 papers submitted by students from all parts of the country. The scholarship provides tuition and all reasonable expenses during four years at college, and is valued at $4000.

Canadian Goodyear Profit

The financial statement of Canadian Goodyear, for the fiscal year ending Sept. 30 last, after setting aside a reserve of $406,875 for plant depreciation, shows net profits of $1,062,023. This brings the net surplus to date to $1,462,912 and the cash balance to $1,266,535.

$1000 Fire at Republic

Fire broke out in the beadroom of the Republic plant at Youngston, Ohio, on Nov. 28, causing a loss to the machinery and equipment of about $1000. Factory operations were not interfered with.

Akron's Busy Winter

Akron tire manufacturers are laying plans for a busy winter in production. Based upon the first trade acceptances for spring business received and upon the statements of tire dealers throughout the country, Akron faces the busiest producing season in its history in order to make enough tires to meet the spring demand.

Dealers everywhere are ordering supplies with less conservation than was shown last year, when they held supplies down so as to get quicker turnover of stock on their shelves.

Goodyear Workers Ask Raise

A wage increase of not less than 15 per cent is asked by the members of the joint conference committee of the Goodyear Industrial Assembly in a plan which is being presented to company officials. The increase is to apply to all piece workers, day workers, and salaried employees and to become effective Dec. 16. Living costs of the average factory worker in Akron have increased between 10 and 30 per cent during the year 1922, according to the conference committee.

Rubber Glove Unit for Miller

The Miller Rubber Co., Akron, Ohio, has drawn up plans for the construction of a new factory to be devoted exclusively to the production of rubber gloves. The company expects to have the plant in operation by March 1, 1923. Thoroughly modern equipment will be installed for the manufacture of surgical and household rubber gloves of all kinds. Miller is said to have been the first concern in the world to make and place rubber gloves on the market.

Good Roads Exposition

The thirteenth American Good Roads Congress and fourteenth Good Roads Exposition, under the auspices of the American Road Builders' Association, will be held in Chicago from Jan. 15 to 19. The congress will hold sessions in the Congress Hotel and the exposition will take place in the Coliseum and Annex. The association has sent out 85,000 invitations to interested individuals and organizations. President T. J. Wasser of the association in his annual address on Jan. 16 will propose uniform highway traffic regulations throughout the country by joint action of his organization, the American Society of Automotive Engineers, the American Automobile Association, the National Automobile Chamber of Commerce, the American Association of State Highway Officials, the Bureau of Public Roads, and other agencies.

Among the exhibitors at the exposition of interest to the rubber industry will be the Overman Cushion Tire Co., Inc., The Barrett Co., The Asphalt Association, and the Link-Belt Co.

Personals

H. H. Replogle has resigned as manager of the Intermediates Division of the National Aniline & Chemical Co. to become sales manager of the Wamesit Chemical Co., Lowell, Mass. He is said to have been the first man to introduce "technical service" to the rubber industry on a large, commercial scale.

* * *

C. H. Hobson, former secretary of the Gillette Rubber Co., has been appointed assistant to R. B. Tracy, sales and advertising manager of the Paul Rubber Co., Salisbury, N. C.

* * *

T. F. Walsh, president of Swinehart, has returned to the Akron factory following a business trip through a number of eastern states.

* * *

T. H. Wilkinson, for a number of years manager of the U. S. Rubber Co. branch in San Francisco, is now in charge of the San Francisco office of Lee Tire & Rubber Co.

* * *

W. S. Hine, secretary to Harvey S. Firestone, president of Firestone Tire & Rubber Co., is on a business tour of European countries.

* * *

R. H. Jeffers, who has been connected with Firestone for many years, has been appointed vice president and general manager of the company's Canadian subsidiary plant at Hamilton, Ontario.

* * *

J. C. Holcomb, Swinehart manager of New York City, and Major Poole, of the company's branch there, made a flying trip by automobile from Akron to New York recently, covering the distance in thirty hours.

* * *

J. A. Sheridan, formerly with Goodyear, is covering the New England north shore territory for Firestone-Apsley's new line of rubber heels.

* * *

C. P. Peschmann, former Goodyear branch manager at Cleveland, has joined the Denman-Myers Cord Tire Co. as head of the eastern sales division.

* * *

William N. Freeman has resigned as executive manager of the Madison Tire & Rubber Co., Buffalo, and has bought the plant of the Batavia Rubber Co., Batavia, N. Y. from the creditors. Freeman cord tires will be manufactured there.

* * *

J. Healey, representing W. & A. Bates, Ltd., of Leicester, England, rubber goods manufacturers, was a recent visitor at the Goodyear plant in Akron.

New Child's Rubber Heel

Goodyear has added to its line a rubber heel for children's footwear, known as the "Junior Wedge Heel." Hundreds of pairs of children's shoes equipped with the new heel have been shipped to dealers, as an experiment.

FRANK P. HARRINGTON
Director of Sales for the Star Rubber Co., Akron, Ohio

Frank P. Harrington Sales Director for Star

Frank P. Harrington, well known from coast to coast through his twenty-one years of close affiliation with the rubber industry, has been appointed director of sales for the Star Rubber Co., Akron, Ohio. He was in the sales department of Goodrich for ten years, of Miller for nine years, and the remainder of the time with Dayton. He will unquestionably prove a valuable acquisition to the Star Company.

C. C. Miller, formerly manager of the Goodyear branches in Seattle, Spokane and Butte, is now manager of the Seattle branch of the Lee Tire & Rubber Co. which occupies its own building in that city.

* * *

The Lee branch in Portland, Ore., is in charge of D. L. McPhee, formerly with U. S. Rubber.

* * *

G. B. Kemp and R. S. McClintock of the Inland Battery Co., Spokane, will have charge of Lee Tire interests in that city.

* * *

P. E. Crawley, with headquarters in Butte, Mont., has the distribution of Lee tires in eight counties in that state.

Spencer Acquitted

Frank D. Spencer, former secretary and treasurer of the Knox Tire & Rubber Co., Mount Vernon, Ohio, who was tried in the Ashland county common pleas court on a charge of embezzlement, was acquitted by the jury and discharged from custody.

New Plant for Rochester, Pa.

The Rochester Rubber Products Co. has been organized to operate a plant at Rochester, Pa. The company plans to manufacture tires, mechanical rubber goods, floor coverings, hard rubber battery boxes, and other articles. P. E. Welton, of the Akron Engineering Co., is president; Charles C. Hubbell of Cleveland is vice president and general manager; and Walter M. Goettman of Beaver, Pa., is treasurer. The company expects to employ 400 men when factory operations are well under way.

Scrap Rubber Men Meet

A meeting of the Scrap Rubber Division of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, on Dec. 19. The improved condition of the scrap rubber market was discussed and members of the division were optimistic over the outlook for next year.

Middletown Bankrupt

The Middletown Rubber Co., Inc., 80 Washington street, Middletown, N. Y., filed a petition in bankruptcy on Dec. 6, listing liabilities of $28,221 and nominal assets of $129,826. The principal creditor is the Orange County Trust Co. which holds a mortgage on the plant as security for a loan of $20,000.

Firestone Branch Moves

Firestone's Toledo branch has moved to larger quarters at Spielbush and Michigan avenues. George F. Guinn is manager of this branch, and warehouse distributing points are being opened in Lima, Ohio, and Fort Wayne, Ind.

350,000,000 *PAIRS OF RUBBER HEELS IN* 1922

THE production of rubber heels in 1922 is estimated to reach 350,000,000 pairs, or almost enough to provide one pair for every inhabitant of China. Of this immense quantity 200,000,000 were made in Akron factories. The value of the entire output is placed at $30,000,000.

In 1921 Miller produced more than 40,000,000 pairs, Goodyear more than 30,000,000, and Goodrich more than 20,000,000. Firestone recently started production in this branch and will be one of the big makers in 1923 on new shoe contracts in hand. Goodyear's rubber heel output this year is about 50 per cent greater than last year's.

United States census figures for 1919 gave the total output at 138,000,000 pairs valued at $16,103,000. Thus the quantity has much more than doubled in three years, while the market valuation has about doubled.

K-F Heel on the Market

The K-F Heel Co. of Newark, Ohio, is a new company marketing the K-F rubber heel, designed and patented by John C. Krieg. This heel is said to have unusual qualities; it is non-slipping and is thought to wear much longer than the ordinary heel. A contract has been made with New Tread Tire Co., East Palestine, Ohio, to manufacture these heels beginning Jan. 1. The company hopes to have its own factory in Newark within a year or so. Lawrence Krieg is president; F. M. B. Windle, treasurer; William Wobbecke, secretary.

New Rubber Latex Co.

The Rubber Latex Co., Ltd., is a new private company registered in London, with nominal capital, to carry on the business of importing, dealing in and manufacturing from rubber latex as well as rubber fabric, asbestos, leather, linoleum, paper, pulp, paper making materials, etc. D. F. L. Zorn, chairman of the Rubber Shareholders Association, and J. Fairbairn are the directors. The principal business at present will probably be the importation of latex into England for use by paper manufacturers.

Burdick Receivership

Charles W. Jordan, president of the American Trust & Savings Bank, Richmond, Ind., appointed receiver for the Burdick Tire & Rubber Co., Noblesville, Ind., has taken charge of the plant. The company, said to be a $5,000,000 concern, has not operated the plant since the new building was occupied two years ago but has retained a factory manager and superintendent. The company is said to owe delinquent county taxes amounting to $19,000. The receiver made no statement as to the future disposition of the property.

Investors Want Money Back

Thirty-seven preferred stockholders of the Brietson Mfg. Co., a South Dakota corporation organized to make tires, have filed suits in the district court at Omaha, Neb., demanding the return of more than $50,000 invested by them. The petitions allege that O. A. Brietson, president of the company, now under federal indictment for using the mails to defraud, acquired control by fraudulent means. The court issued a writ of attachment and garnishment against the company's property. Brietson is said to be in Minneapolis.

New Brazil Rubber Co.

Rubber goods are now manufactured by S. A. Somell, of Rio de Janeiro. Among the products of this plant are rubber soles and heels, rubber sheets, and nonstretching rubber belting for transmission purposes.

New Wildman Plant at Bay City, Michigan

The illustration shows the new factory building of the Wildman Rubber Co. which is under construction at Bay City, Mich. It will have a daily capacity of 2500 tire casings and 5000 inner tubes, according to a letter from W. W. Wildman, president, to the editor of THE RUBBER AGE. "This first unit is so arranged," he says, "that we can increase our capacity from time to time, to almost an unlimited quantity." The site occupies sixty-three acres of ground on the Saginaw river.

At the Bay City plant there will be manufactured Wildman cord tires, Standard inner tubes, and the new Wildman self-sealing inner tubes for which basic patents have been obtained. At Port Clinton, Ohio, is another plant where the Wildman Tire & Rubber Co. is now turning out tires and tubes.

Herbert R. Hewitt

Herbert R. Hewitt, founder and president of the Hewitt Rubber Company, died in Buffalo, N. Y., on Dec. 19. He was born in Detroit sixty-seven years ago and as a youth entered the employ of the Pullman Works in Chicago and soon became manager. He came to Buffalo twenty years ago, where he engaged in the brass and rubber manufacturing business.

Trying to Save Hydro

More than 200 stockholders of the Hydro United Tire Co. met at the Pottstown, Pa., plant on Nov. 30 to discuss and adopt plans for obtaining funds to keep the business going. One plan was to assess to stockholders in the amount of $700,000 to lift the receivership, and another was to raise a loan of $500,000 on condition that a new board of directors be elected. It is reported that the assets of the company, at a receiver's sale would not realize more than $250,000.

Rubber Goods for African Mines

The noticeable improvement in the South African mines is likely to cause an increased demand for mining supplies, including belting, hose, and other mechanical rubber goods. The various supplies purchased by the mines in 1921, include belting, £190,897; hose and fittings, £134,044; packing, £57,120; rubber boots and waterproofed clothing, £31,011.

Japanese Rubber Companies

Owing to the depression in the rubber plantations, the Nettai Sangyo Kaisha, the Malay Rubber Co., the South Seas Rubber Co., the China-Japan Rubber Co., the Johol Rubber Co., and the Sumatra Rubber Plantation Co. have presented an appeal to the Government for help. A similar appeal has been made to the Government by the Japanese companies in the neighborhood of Singapore. The Government took the view that the relief of the rubber industry is impossible, and advised them to amalgamate or form a syndicate. Representatives of the Sumatra Rubber Plantation Co., the Sumatra-Koygo Co., the Nanyo Rubber Co., and the Borneo Rubber Co. met at Nanyo Kyokai, Toyko, on September 28 to discuss the question of amalgamation. It was decided to consider the question of dividing all the rubber-growing companies into three groups, namely, the companies along the Johol River, those along the Maley Railway Line, and those in Sumatra. The rubber-growing companies along the Johol River and the Maley Railway are also to hold meetings shortly.

French Dunlop Factory

The new Dunlop factory has started operations at Mountlucon, Allier, France. The factory was purchased nearly four years ago to take the place of the original Paris factory. It is stated that 5,000 workmen are employed and that there are accommodations for 700 families.

MARKETS

Cottons and Fabrics

NEW YORK, December 22, 1922

COTTON production this year is the smallest in twenty years, excepting last year's small crop, according to the final estimate of the season made public on December 12 by the Department of Agriculture. The crop was placed at 9,964,000 bales and is smaller by 171,000 bales than any of the government's forecasts of the season made from condition reports during the growing season. This compares with 7,953,641 last year 13,439,603 two years ago 11,420,763 in 1919 and a ten year average of 12,279,348.

The low cotton yield notwithstanding the large acreage was the result of the great damage by the boll weevil and the rapidly diminishing production is shown in the monthly forecasts.

July forecast	11,065,000 bales
August forecast	11,449,000 "
September forecast	10,575,000 "
October forecast	10,135,000 "
December estimate	9,964,000 "

A Crop of Enormous Value

The farm price of cotton on December 1 averaged 23.8 cents a pound and on this basis, which is the fourth highest price for cotton in the entire history of the industry, the aggregate value of the crop is $1,134,608,356. Then there are many millions of dollars more represented by some 500,000 pounds of linters which must be added to the official estimate of lint production. Throughout the first six months of last year cotton sold from 10 to 14 cents a pound; a price much below the cost of production.

Mill demand continues active and consumption for the first quarter ending November 1 amounted to 1,738,000 bales, inclusive of linters, compared with 1,627,000 during the corresponding three months last year which if maintained at this rate would represent about 7,000,000 bales for the season.

Comparison With Other Estimates

The Department's estimate of this seasons crop compares as follows with the estimates of crops of preceding years:

	Bales.		Bales.
1922	9,964,000	1920	13,374,237
1921	8,039,673	1919	11,382,684
1918	11,983,582	1909	10,148,076
1917	11,342,780	1908	13,207,157
1916	11,460,084	1907	11,157,096
1915	11,124,031	1906	13,117,310
1914	15,934,649	1905	10,635,023
1913	14,032,792	1904	13,599,412
1912	13,529,850	1903	10,205,073
1911	15,603,850	1902	10,588,250
1910	11,624,777	1901	9,582,520

Consumption Greatest in Five Years

The monthly report on cotton consumption shows that more cotton was used during the month of November than in any month since October 1917. The cotton used amounted to 577,561 bales of lint and 55,122 of linters compared with 533,950 of lint and 62,406 of linters in October this year, and 527,940 of lint and 57,949 of linters in November last year. Cotton exports for November were 858,337 bales, including 2,827 bales of linters, compared with 798,664 bales, including 1,535 of linters in October.

The cotton report had little effect on prices as the unfavorable estimate made was about what was expected.

Cotton prices as of December 16 on the New York Cotton Exchange follow:

	Open.	High.	Low.	Close.	Prev. Day.
Dec.	25.50	25.50	25.29	25.29@32.00	25.51
Jan.	25.56	25.60	25.23	25.23@25.00	25.57
March	25.72	25.79	25.47	25.47@49.00	25.78
May	25.80	25.88	25.58	25.59@60.00	25.87
July	25.50	25.60	25.30	25.30@32.00	25.61
Oct.	23.92	24.00	23.70	23.73	24.00

EXTRA STAPLE COTTON

There was little interest in extra staple cotton during the last period and such activity as prevailed at any time was for small lots of medium and lower grades at lowered prices. At no time was there any general selling pressure. Prices on the longer types are off from 1½ to 2 cents from two weeks ago.

Egyptians are lower and in light demand. Medium grade Sakellarides can be had as low as 34 to 34½ cents and fairly good grades at 35 to 35½ cents.

Pimas continue in good demand, particularly threes and fours with little of the threes available on spot. Medium grade Peruvian Mitaffifi is quoted at 31 to 33 cents.

Strict middling, extra staple cotton is quoted as follows: inch and one eighth, 30½ at 31½ cents; inch and three sixteenths, 32 at 33 cents; inch and a quarter, 34 at 35 cents; inch and five sixteenths, 36 at 37 cents.

CORD FABRICS

Combed Sakellarides	.80	@	.85
Carded Sakellarides lb.	.75	@	.80
Combed Peeler lb.	.75	@	.80
Carded Peeler lb.	.62	@	.67
Combed Egyptian uppers lb.	.75	@	.80
Carded Egyptian uppers lb.	.70	@	.75

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed lb.	.73	@	.77
17¼-ounce Egyptian uppers, carded lb.	.67	@	.73
17¼-ounce Sakellarides, combed lb.	.77	@	.82
17¼-ounce Sakellarides, carded lb.	.72	@	.77
17¼-ounce Peeler, combed lb.	.73	@	.78
17¼-ounce Peeler, carded lb.	.60	@	.64

SHEETINGS—There was no special activity in sheetings following the government report on cotton production. 40 inch, 3.60 was quoted at 13½ cents; 40 inch, 4.25, at 10¾ cents and 40 inch, 2.85, at 15 to 15¼ cents.

DUCKS—The price situation remains the same. Single and double filling duck are sold up to March and belting and hose are scarce in some constructions. Enameling was on contract for March delivery. Single filling is quoted at 22 to 22½ cents a pound, price varying according to width and double filling 24 to 24½ cents. Hose and belting brings 48 to 49 cents a pound in first hands.

BURLAP—A customs regulation now requires that all bolts must be marked Made in Calcutta. The ruling is not intended to apply to cargoes on the high seas or shipments made before January 15. Prices were advanced with the rise in sterling but very little substantial business is being done.

SHEETINGS

40-inch 2.50-yard yd.	.18½	@	—
40-inch 2.85-yard yd.	.15	@	.15¼
40-inch 3.15-yard yd.	.15¼	@	.15½
40-inch 3.60-yard yd.	.13½	@	—
40-inch 3.75-yard yd.	.12	@	—
40-inch 4.25-yard yd.	.10¾	@	—

DUCKS

Belting lb.	.48	@	.49
Hose lb.	.48	@	.49
Enameling lb.	.48	@	.50
Shoe Ducks lb.	.55	@	—
Single filling lb.	.22	@	.22½
Double filling lb.	.24	@	.24½

BURLAPS (Carload Lots)

8 -ounce 40-inch	7.20	@	—
7½-ounce 40-inch	7.10	@	—
10 -ounce 40-inch	8.90	@	—
10½-ounce 40-inch	9.00	@	—

DRILLS

37-inch 3.25-yard yd.	.14	@	—
37-inch 2.75-yard yd.	.15¾	@	—
37-inch 3.00-yard yd.	.14¾	@	—
37-inch 3.50-yard yd.	.13½	@	—
37-inch 3.95-yard yd.	.12¼	@	—
87-inch 3.95-yard yd.	.12¼	@	—

OSNABURGS

30-inch 7-ounce	.17	@	—
40-inch 7-ounce	.17½	@	—

COTTON EXPORTS FROM ALEXANDRIA

Alexandria, November 24, 1922

	Receipts Alexandria Cantars	Exports in Bales to England	Continent	America	Total Exports Cantars	Stock Alexandria Cantars
This week	358,763	21,887	9,521	8,462	302,919	2,681,855
Same week 1921	208,833	8,369	3,841	5,664	136,624	2,320,074
" " 1920	194,722	5,402	3,954	945	78,913	1,302,608
Since 9/1/1922	3,088,192	114,212	69,176	45,086	1,738,337	—
Same time 1921	2,240,176	104,673	64,334	61,461	1,755,102	—
" " 1920	1,548,255	48,335	28,326	7,549	643,849	—

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, DECEMBER 22, 1922—The approach of the close of the year finds the market for industrial chemicals very quiet. Prices are generally steady and inclined toward firmness on advancing costs and scarcity. It may be that buyers are restricting their purchases to immediate wants so as to keep inventories to a minimum and that after the inventory season is over active buying will be resumed. There is a general feeling that after the turn of the year it will not be long before the consuming demand will bring activity into the market. Large producers are inclined to take a very optimistic view of the situation.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95 @	—
Aniline oil, bulk basis,	lb.	.16 @	.17
Excellerex,	lb.	.40 @	.45
Formaldehyde-Aniline	lb.	.52½ @	—
Hexamethylene-tetramine	lb.	.95 @	.97½
Paraphenylenediamine	lb.	1.50 @	1.55
Thiocarbanilide, kegs	lb.	.29 @	.31
Vulcocene	lb.	.35 @	—

Inorganic

Lead, dry red bbls.	lb.	.09 @	.09¼
Lead, white, basic carbonate	lb.	.07¼ @	.08
Litharge, domestic	lb.	.09⅜ @	—
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02 @	.02½
Magnesia, calcined, light	lb.	.22 @	.24
extra light	lb.	.45 @	—
heavy	lb.	.05 @	.05½
Orange Mineral	lb.	.13¼ @	.14¼

COLORS

Blacks

Carbon Black	lb.	.16 @	.20
Micronex	lb.	.17 @	.24
Lamp Black	lb.	.12 @	.40
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.16
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.55 @	.60
Ultramarine	lb.	.09 @	.30
Cobalt	lb.	.21 @	.26

Browns

Iron oxide	lb.	.05 @	.06
Sienna, Italian,	lb.	.05½ @	.14
Umber, Turkey,	lb.	.04 @	.05
Vandyke, domestic		.03½ @	.04½

Greens

Chrome, light	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—

Reds

Antimony, crimson	lb.	.40 @	.42
golden	lb.	.21 @	—
red sulphuret	lb.	.20 @	.22
Indian, English, pure	lb.	.12 @	.15
Para toner	cwt.	1.00 @	1.10
Toluidine toner	lb.	2.10 @	—
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	1.25 @	1.30
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.	.55 @	.60
Asolith	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06 @	.06½
Zinc oxide, American Horse Head Special	lb.	.07½ @	.08
XX red	lb.	.07 @	.07½
American Azo: ZZZ (lead free)	lb.	.07 @	.07½
ZZ (under 5 per cent leaded)	lb.	.06¼ @	.06¾
Z (8-10 per cent leaded)		.06 @	.06¼
Zinc oxide, French process, White seal	lb.	.11 @	.11¼
Green seal	lb.	.10 @	.10¼
Red seal	lb.	.09¼ @	.10

Yellows

Chrome, light	lb.	.17 @	—
dark	lb.	.17 @	—
medium	lb.	.17 @	—
Ocher, French	lb.	.02¾ @	.03½
domestic	lb.	.02½ @	.03

COMPOUNDING INGREDIENTS

Aluminum flake	ton	22.50 @	30.00
hydrate	lb.	.16 @	.18
Ammonia carbonate,	lb.	.09 @	.09½
Barium carbonate	ton	75.00 @	80.00
Barium Dust	lb.	.04½ @	—
Barytes, southern off-color,	ton	15.00 @	20.00
Western, prime white,	ton	26.00 @	—
Basofor	lb.	.04¾ @	—
Blanc fixe, dry, f.o.b. works	lb.	.04¼ @	.04½
Carrara filler	lb.	.01½ @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04¼
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	15.00 @	16.50
imported	ton	16.25 @	23.25
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	22.00 @	32.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.04 @	.08
amorphous	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid rubber	lb.	.15 @	—
Mica, powdered	lb.	.15 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Silica (gold bond)	ton	31.00 @	—
Soapstone, powdered	ton	12.00 @	15.00
Starch, powdered	cwt.	2.80 @	2.90
Talc, domestic	ton	15.00 @	18.00
French	ton	25.00 @	32.50
French, high grade	ton	43.00 @	48.00
Italian	ton	47.00 @	58.00
Terra Alba	cwt.	1.85 @	2.00
Tripoli, white	lb.	.02 @	.02½
Whiting, commercial	cwt.	1.00 @	1.10
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.50 @	2.00
gilder's bolted	cwt.	1.10 @	1.25
Paris white American	cwt.	1.25 @	1.35
Wood pulp XXX	ton	32.00 @	—
" " X	ton	25.00 @	—
Zinc Oxide— 5 per cent leaded		.06½ @	.06¾
10 per cent lead sulphate	lb.	.06¼ @	.06½
20 per cent lead sulphate	lb.	.06¼ @	.06½
35 per cent lead sulphate	lb.	.06¼ @	.06½

(Also see whites)

MINERAL RUBBER

Gilsonite	ton	65.00 @	—
Genasco (factory)	ton	60.00 @	—
Hard hydrocarbon	ton	32.00 @	42.00
Soft hydrocarbon	ton	30.00 @	35.00
Pioneer M.R.	ton	42.00 @	44.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	35.00 @	45.00
Synpro, granulated, M. R. (factory)	ton	54.00 @	69.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	3.17 @	3.92
Cresylic, 97 p. c.	gal.	.60 @	.62
95 p. c.	lb.	.55 @	.57
Muriatic, 20 degrees	cwt.	1.00 @	1.10
Nitric, 36 degrees	cwt.	4.50 @	5.00
Sulphuric, 66 degrees	ton	14.00 @	16.00
60 degrees	ton	9.00 @	12.00
Tartaric, crystals	lb.	.32 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.45 @	3.75
Soda ash, 58 p.c.	cwt.	1.95 @	2.30

Oils

Castor, No. 3, bbls.	lb.	.12 @	—
Corn, crude, bbls.	lb.	.10 @	—
refined	lb.	.11½ @	—
Chinawood, bbls.	lb.	.12¾ @	.13
Cottonseed,		.10½ @	.11
Glycerine, drums	lb.	.18½ @	.19
Linseed, domestic	gal.	.87 @	—
imported	gal.	.86 @	—
Palm Niger		.06¾ @	.07
Lagos	lb.	.07¼ @	.07½
Peanut, domestic, crude	lb.	.11¾ @	.12
Petrolatum, amber	lb.	.04½ @	.04¼
dark amber	lb.	.03¾ @	.03¾
Pine, steam distilled	gal.	.80 @	.85
Rapeseed, refined	gal.	.78 @	.81
blown	gal.	.92 @	.95
Rosin, first rectified	gal.	.45 @	—
second rectified	gal.	.47 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean		.10¾ @	.11
Petrolatum, standard	lb.	.05 @	.08

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.10
soft	lb.	.09 @	.10
Tar Retort	bbl.	11.00 @	—
kiln burned	bbl.	12.50 @	—
Pitch, Burgundy	lb.	.05 @	—
coal tar	ton	.01½ @	—
pine tar		.03½ @	—
Rosin, grade K	bbl.	6.50 @	—
Shellac, fine orange	lb.	.90 @	—

Solvents

Acetone, drums	lb.	.21 @	—
Alcohol, denatured, No. 1 bbls.	gal.	.43 @	.45
Benzol, 90 per cent	gal.	.27 @	.32
pure	gal.	.30 @	.35
Carbon bisulphide,	lb.	.06½ @	.07½
tetrachloride	lb.	.10 @	.10½
Dimethylaniline	lb.	.36 @	.38
Motor gasoline, steel bbls.	gal.	.24 @	—
Naptha, V. M. & P.	gal.	.23 @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	1.39½ @	—
wood	gal.	1.32 @	—

Waxes

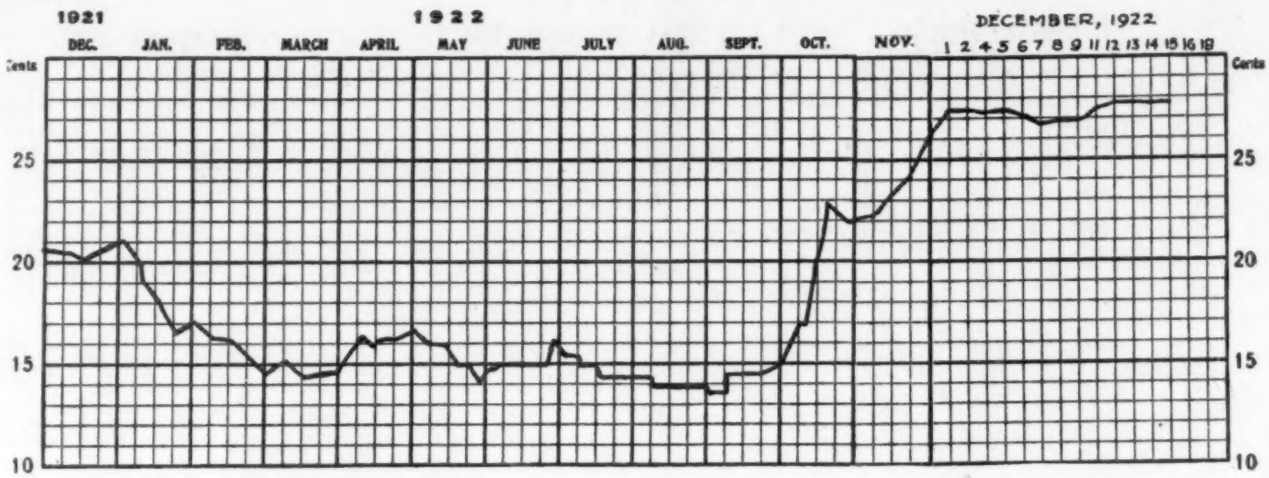
Beeswax	lb.	.40 @	.45
Carnauba, No. 1	lb.	.20 @	—
Ceresin, white	lb.	.09 @	.10
Bayberry	lb.	.20 @	.24
Montan, crude	lb.	.03¼ @	.03¾
Ozokerite, black	lb.	.23 @	.24
green	lb.	.27 @	.28
Paraffine	lb.	.02¾ @	.04
Sweet wax	lb.	.12 @	—

SUBSTITUTES

Black	lb.	.07 @	.14
White	lb.	.08 @	.16
Brown	lb.	.10 @	.15
Brown factice	lb.	.07 @	.15
White factice	lb.	.08½ @	.15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.25 @	.35
Sulphur chloride (jugs)	lb.	.13½ @	.15
" " (drums)	lb.	.08 @	.10
Sulphur flour (bbls.)	cwt.	2.60 @	3.15
(bags)	cwt.	2.35 @	2.90
100 per cent pure (superfine)	cwt.	2.60 @	3.15
Sulphur, 100 per cent pure, Bergenport brand (bags)	cwt.	2.30 @	2.65
(bbls.)	cwt.	2.55 @	2.90



COURSE OF MARKET PRICES OF RIBBED SMOKED SHEET AT NEW YORK FROM DEC. 1, 1921, TO DEC. 15, 1922

Zinc Oxide—The demand for both French process and leaded grades continues very good and contracts are being made for delivery six months ahead. Quotations were: French process, red seal, bags, 8¾ cents; per pound; barrels, car lots, 9¼ cents; green seal, bags 9¾ cents; barrels, car lots 10 cents; white seal, barrels, car lots, 11 cents; American process, commercially lead free, barrels, car lots, 7½ cents; 5 per cent leaded sulphate, barrels, car lots, 6½ cents; 10 to 35 per cent, barrels, car lots, 6¼ cents.

Barytes—Considerable forward business is being booked at present prices. No advance has been made in Southern off color to meet the advance made in Western prime. The market situation continues the same as during the last period with Western quoted at $26 a ton f.o.b. point of production and Southern off color at $15 to $20.

Lithopone—The market continues very active and a good deal of material is being sold for delivery next year. Imported is being shaded to meet domestic prices. Quotations on domestic were 6 to 6¼ cents, bags, car lots; 6 to 6½ cents, barrels, car lots; 6¼ to 6½ cents, barrels, less than car lots. Imported is offered at 6 cents, ex store.

Blanc Fixe—There was only routine demand and prices remained the same, dry being quoted at 4¼ to 4½ cents a pound and pulp, $40 to $50 a ton.

Litharge—There was a good demand from the tire manufacturers which promises to continue well into next year. Producers are well satisfied with the season's business. There is no talk of any change in prices and casks continue at 9.65 cents; kegs less than 500 pounds, 13.25; 500 to 2000 pounds, 11.92 cents; 2000 to 10,000 pounds, 11.44 cents and 10,000 to 30,000 pounds, 11.03 cents.

Caustic Soda—The same vigorous demand was maintained in the market for caustic soda and there is talk of an advance in price inasmuch as the cost of production continues to increase. Quotations on standard brands were 3.45 to 3.75 on 76 per cent.

Crude Rubber

NEW YORK, December 18, 1922

STEADY but quiet describes the condition of the crude rubber market at this writing. There has been practically no change in the quotations of the entire list since our report of two weeks ago. London cables today report about the same situation in that market, with spot rubbber at 14 pence.

The rubber goods factories hesitate at this time of the year to add to their inventories of crude rubber stocks; hence buyers are waiting until after January 1 before again coming into the market to any extent. We may look for a quiet but firm tone to prices, therefore, until after the opening of the New Year. There is not likely to be any pronounced recession in values.

The quotations given on the Pontianacs and Balatas are merely nominal, as there do not appear to be many supplies of these grades in this market.

Quotations as of this date are practically as follows:

Plantations			
Ribbed Smoked Sheets	.27½	@	.27⅝
First Latex, spot	.27½	@	.27⅝
January/March	.27⅞	@	—
April, May, June	.28⅝	@	—
July/December	.29⅝	@	—
Amber Crepe No. 1, spot	.27⅜	@	—
Amber Crepe No. 2, spot	.27¼	@	—
Amber Crepe No. 3, spot	.27	@	—
Light Clean Thin Brown Crepe	.26½	@	—
Commercially Clean Thin Brown Crepe	.26	@	.26¼
Specky Brown Crepe	.25½	@	—
Roll Brown Crepe, spot	.25½	@	—
Paras			
Madeira Fine	.27⅝	@	.27¾
Acre Fine	.24½	@	—
Up-river Fine	.24½	@	—
Up-river Medium	.22½	@	—
Up-river Caucho Ball (shipment)	.21½	@	—
Up-river Coarse	.19½	@	—
Islands Fine	.22	@	—
Islands Medium	.20	@	—
Islands Coarse	.12½	@	.13
Cameta	.12½	@	—
Xingu Ball	.19½	@	—
Tapajos Fine	.22¾	@	.23
Pontianac			
Prime Pressed	.16	@	—
Plantation	.07¾	@	—
Bangermassin	.08½	@	—
Siak Gutta Percha	.21½	@	—
Prime Macassar	3.00	@	—
Balata			
Panama Block	.40	@	—
Surinam Sheets	.75	@	—
Columbia Block	.55	@	—
Venezuela Block	.70	@	—

Reclaimed Rubber

NEW YORK, December 18, 1922

This market is steady, and some of the grades are considerably higher in price than two weeks ago. Floating and friction have both risen about 2 cents and others on the list are up from ½ to 1 cent. There is, however, no great stimulus to buying at present. The reclaimed rubber plants are running at 50 to 60 per cent of capacity. If crude rubber goes to 30 cents a larger proportion of reclaims will undoubtedly be called for by the factories.

Quotations of this date are practically as follows:

Standard Reclaims			
Floating	.15½	@	.16½
Friction	.15½	@	.16½
Boots and Shoes	.11	@	.11½
Boots and Shoes (washed)	.13½	@	.14
Mechanical	.09	@	.10
Hose	.10	@	.11
Tires, truck	.09	@	.10
Tires, auto	.09½	@	.10
White	.13	@	.14

Scrap Rubber

NEW YORK, December 18, 1922

Prices are virtually unchanged from those given in our last report. Dealers are a little excited over the outlook and anticipate a brisker demand and better prices, but the factories which use large quantities of scrap are holding off at present, probably being unwilling to add to their stocks until after the first of the year.

Quotations of this date are as follows:

Auto tire peelings	.01	@	—
Standard White auto ton	20.00	@	22.00
Mixed auto ton	12.00	@	14.00
Bicycle tires	.00½	@	.00⅝
Clean solid truck tires	.01⅜	@	.01½
Boots and shoes	.03½	@	.03⅝
Arctics, trimmed	.02½	@	.02⅝
Arctics, untrimmed	.02⅛	@	.02¼
Inner tubes, No. 1	.04	@	.04¼
Inner tubes, compounded	.03¼	@	.03½
Inner tubes, red	.03¼	@	.03⅜
Battery jars, clean hard rubber	.00¾	@	.01
Heels and pads	Nominal		
Black mixed	Nominal		
Garden Hose	.00⅝	@	.00½
Air brake hose	.00⅝	@	.00¾
Steam and water hose	.00⅝	@	.00½
Red packing	.00½	@	.00⅝
White mixed rubber	.00¾	@	.01
White druggist sundries	.01	@	.01¼

American Rubber Patents

1,435,526 John F. Johnston and George W. Bulley, Akron, Ohio, assignors to The Miller Rubber Co. Method of Forming Hard-Rubber Articles.

1,435,735 Gilbert F. Quinn, Revere, Mass. Method of Attaching Rubber and Leather Heels to Shoes.

1,435,636 Alfred A. Glidden, Watertown, Theodore E. La Fayette, Wellesley and John J. Gaughan, Cambridge, Mass., assignors to the Hood Rubber Co. Method of Making Rubber Footwear.

1,435,218 Harold A. Denmire, Akron, Ohio, assignor to The General Tire & Rubber Co. Process of Applying Washers to Rubber.

1,435,359-60 John C. Wichmann, Los Angeles, Calif. Process of Making A Rubber-like Material.

1,435,616 Clifford C. Mosher, Lima, Ohio. Rubber Masticator.

1,435,659 Fred Thomas Roberts, Cleveland, Ohio, assignor to Paramount Rubber Consolidated, Inc., Philadelphia, Pa., a Corporation of Delaware. Method of and Apparatus for Making Sheet Rubber.

1,435,531 Edward Brice Killen, London, England. Rubber Tire and Its Attachment to Wheels.

1,435,895 Clair G. Hoover, Akron, Ohio, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio. Tire-Making Method and Apparatus.

1,435,566 Cornelius L. Vandeley and Carl J. Jorgensen, San Francisco, Calif. Pneumatic Tire.

1,435,667 Frederick A. Schultz, Hasbrouck Heights, N. J. Vehicle Tire Shoe.

1,437,487 Arthur Biddle, Trenton, N. J., assignor to United Products Corp of America, a Corporation of Delaware. Caoutchouc Composition.

1,438,070 Louis Tuban, Brooklyn, N. Y. Tire Construction.

1,437,870 James A. Swinehart, Akron, Ohio. Tire Cord and Method of Making Same.

1,438,156 Harold M. Brown, Akron, Ohio, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio. Tire Making Machine.

1,437,433 John S. McClurg, New York, N. Y., assignor, by mesne assignments, to Carlisle Tire Corp., a Corporation of Delaware. Tire Mold.

1,438,015 Herbert S. Blynt, Yale, Okla. Pneumatic Vehicle Tire.

1,437,859 William O'Neil, Akron, Ohio, assignor to The General Tire & Rubber Co., Akron, Ohio. Manufacture of Cord Tires.

1,436,028 Charles F. Flemming, Akron, Ohio, assignor to The Miller Rubber Co., Akron, Ohio. Rubber Playing Ball.

1,436,594 Rodney N. McClure, Los Angeles, Calif. Tire.

1,436,146 Charles H. Braden, Los Angeles, Calif. Airless Tire.

1,436,612 Horace D. Stevens, Akron, Ohio, assignor to The Firestone Tire & Rubber Co., Akron, Ohio. Tire-Bead-Building Machine.

1,435,970 Allan B. Merrill, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. Expansible Tire-Vulcanizing Core.

1,436,894 Paul I. Murrill, Plainfield, N. J., assignor to R. T. Vanderbilt Co., Inc., New York, N. Y. Accelerator for Vulcanizing Rubber.

1,436,930 Stanley Adamczyk, Chicopee, Mass. Rubber Heel.

1,437,065 James McGee, Newark, Ohio. Rubber Heel.

1,437,117 Edward D. Putt, Akron, Ohio, assignor to The Firestone Tire & Rubber Co., Akron, Ohio. Gauge for Calendered Rubber Stock.

1,437,013 Alphonso Comstock Pratt, Deep River, Conn., assignor to International Bead Wire Co., a Corporation of Delaware. Grommet or Core for Tire Beads.

1,437,125 Charles L. Archer, Des Moines, Iowa. Cord Tire.

1,436,720 Theodore Naus, Chicago, Ill. Pneumatic Tire.

1,436,782 William B. Shaw, New York, N. Y. Pneumatic Tire.

1,437,275 George J. Stillman, Jersey City, N. J. Resilient Tire.

1,436,695 Lee F. Burke, Detroit, Mich. Inner-Tube Tester for Pneumatic Tires.

Trade Marks Applied For

[The following are trade-mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Marks Company, Barrister Building, Washington, D. C. or Bush Building, 130 West 42 Street, New York, trade-mark specialists. As an additional service feature to its readers this Journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.]

PUT AND TAKE with picture of top in center. No. 159,878. Robert E. McCaughn, doing business as The Put and Take Company, Memphis, Tenn. For automobile tires of rubber and fabric, all rubber patches, rubber inner tubes, blow out patches, and hook and lace on boots of fabric and rubber.

No. 161,420. The Federal Rubber Company of Illinois, Chicago, Ill., and Cudahy, Wis. For casings and tires made wholly or partly of rubber.

No. 161,419. The Federal Rubber Company of Illinois, Chicago, Ill. And Cudahy, Wis. For casings and tires made wholly or partly of rubber.

No. 161,418. The Federal Rubber Company of Illinois, Chicago, Ill. And Cudahy, Wis. Illinois, Chicago, Ill. And Cudahy, Wis. For casings and tires made wholly or partly of rubber.

No. 161, 417. The Federatel Rubber Company of Illinois, Chicago, Ill. And Cudahy, Wis. For casings and tires made wholly or partly of rubber.

No. 161,416. The Federal Rubber Company of Illinois, Chicago, Ill. And Cudahy, Wis. For casings and tires made wholly or partly of rubber.

W. C. Q. CO. as monogram within frame below word "Monogram". No. 164,115. W. C. Quarles Co., Inc., Richmond, Va. For inner tubes, innertube patches, and blow out patches.

APRUB—in white letters on black disc within a circle. No. 164,997. Appleton Rubber Company, Franklin and Boston, Mass. For rubber compound splicing tape and gray friction adhesive tape.

PEN-LYN—No. 166,800. White-House & Hardy, Inc., N. Y. C. For shoes of leather, leather and fabrics, leather and rubber.

MAR-GAR—No. 166,799. White-House & Hardy, Inc., N. Y. C. For shoes of leather, leather and fabrics, leather and rubber.

BO-LO—No. 166,797. White-House & Hardy, Inc., N. Y. C. For shoes of leather, leather and fabrics, leather and rubber.

NATURE-FLEX, across sole of shoe. No. 166,-619. Jordan Marsh Company, Boston, Mass. For men's, women's, misses', boys', and children's boots, and shoes made of leather, rubber, canvas, and canvas with leather trimmings.

INDIAN WALK, below picture of an Indian on a shoe. No. 165,156. Harold Chase Kimball, N. Y. C. For men's, women's and children's shoes, boots, slippers, moccasins, gym shoes, gaiters, and pumps made of leather, fabric, and combinations of same.

FANCIFUL picture of "Innocence", by Sir Josiah Reynolds, No. 165,156. Thomas G. Plant Company, Boston, Mass. For boots, shoes, and slippers of leather, rubber, felt, silk, cloth, or other fabric construction.

MOON-SHINE TIRE-PATCH, on rim of circle about picture of Man in the Moon. No. 145,476. Harry L. Roemer, doing business as Centralia Patch Co., Centralia, Ill. For sheet rubber patches.

"BOBBIE"—No. 165,613. The Vulcanized Rubber Company, Portland, Me. For rubber combs.

INCA—No. 165,618. Blakey's Boot Protectors, Limited, Leeds, England. For pads manufactured from rubber or rubber composition for application to boots and shoes.

F—within a shield. No. 167,123. The Firestone Tire and Rubber Company, Akron, Ohio. For shoe soles and heels, made of or containing rubber.

RADIO within an oval. No. 165,230. Cambridge Rubber Company, Cambridge, Mass. For footwear, namely, boots and shoes of rubber, canvas and rubber, canvas, leather, and rubber.

POGO—No. 164,799. Brown Shoe Company, Inc., St. Louis, Mo. For shoes for men, women, and children, made of leather, rubber, fabric and combinations thereof.

ARCHWAY—No. 169,198. Edwin Clapp & Son, Inc., East Weymouth, Mass. For boots and shoes made wholly or in part of leather, rubber, canvas, or textile fabrics.

JULIA MARLOWE—No. 168,127. The Rich Shoe Company, Milwaukee, Wis. For ladies' shoes made wholly or in part of leather, rubber, canvas, or textile fabrics.

New Incorporations

CONNECTICUT

Petroleum Fuel Corporation, to buy and sell oils, rubber goods, etc. 50,000. Incorporators: Charles H. Metcalf, Milton H. Fesler,—Stamford, Connecticut; Homer Clark,—Darien, Connecticut.

DELAWARE

Hansen Rubber Products Co. $250,000. Agent, Corporation Trust Co. of America. Principal office, Wilmington, Delaware.

NEW YORK

Wolfe & Lang, Inc., to manufacture elastic webbing, etc. $50,000. Incorporators: H. E. Lang and A. Wolfe. Principal office, 21 East 21st street, New York City.

The Lufbery Co., Inc., to manufacture rubber substitutes. $100,000. Incorporators: P. G. Gruden, 1 West 8th street, Bayonne, New Jersey.

Continental Tire & Tube Co., Inc., to manufacture tires and tubes. $100,000. Incorporater: F. H. Butehorn, 27 Wall street, New York City.

Batavia Holding Corporation, to manufacture rubber goods. $75,000. Incorporators: S. B. Howard, G. V. Reilly and H. C. Hand. Attorney, S. Ryan, Albany, New York.

Quincy Tire Outlet Co., Inc., to deal in tires. $10,000. Incorporators: J. Brenner, B. Goldman and A. Savarese—New York City. Principal office, Brooklyn, New York.

NEW JERSEY

Empire Tire & Rubber Co., to manufacture rubber tires. $10,000. Incorporators: W. Holt Apgar, William N. Cooper and Thomas H. Baddeley—all of Trenton, New Jersey. Principal office, Trenton, New Jersey.

OHIO

Cleveland Rubber Products Co. $500,000. Principal office, Cleveland, Ohio.

Medina Rubber Co., to manufacture tires and tubes. H. C. Keck, president; S. E. Johnson, treasurer and secretary; D. R. Pelton, vice president; G F. High, Assistant treasurer and secretary. Principal office, Medina, Ohio.

Native Rubber Co., to manufacture tires and rubber goods. 250 shares no par value. Incorporators: M. W. Spear, J. C. Spear, E. M. Hulat, J. M. Birms and J. Kohman. Principal office, Cleveland, Ohio.

States Tire & Rubber Co., to deal in tires and tubes. $10,000. Incorporators: W. J. Moffett, E. J. Lynch, A. W. Shea and F. M. Hackett. Principal office, Toledo, Ohio.

Wear Ever Patch Manufacturing Co., to manufacture rubber patches. $10,000. Incorporators: D. A. Rosenfeld, S. A. Rosenfeld, R. E. Shaffer, E. E. Shaffer and F. Spira. Principal office, Columbus, Ohio.

P. E. Welton Engineering Co., to engage in mechanical and chemical engineering (formerly the Akron Enginering Co.). $50,000. P. E. Welton, president and general manager; G. W. Waldsworth, vice president; J. W. Tyrrell, treasurer and secretary. Attorney, A. S. Mottinger. Principal office, Akron, Ohio.

OREGON

Oregon Rubber & Tire Manufacturing Co. $30,000. Incorporators: T. W. Turel, P. W. Pick and P. A. Lambert.

Johnson Britton Tire Co. $1,000. Incorporators: Norman Britton, Elma Johnson and Howard K. Zimmerman. Principal office, Astoria, Oregon.

TENNESSEE

Tennessee Rubber Co. $25,000. Incorporators: James M. Butler, W. S. Winn, G. B. Sawyer, Al. D. McNight and V. V. Moore. Principal office, Murfeesboro, Tennessee.

Dissolved

The Goshen Rubber and Manufacturing Company of Goshen, Indiana has filed preliminary certificate of dissolution.

Capital Increase

H. H. Allyn Rubber Corp., Philadelphia. $100,000 to $500,000.